ER NO. HAD8704074C9

# Service Manual

Tuner

## QUARTZ Synthesizer AM/FM Stereo Tuner (ST-G45A)

## QUARTZ Synthesizer LW/MW/FM Stereo Tuner (ST-G45AL)

# ST-G45A
# ST-G45AL

**Color**

| |
|---|
| (S) .....Silver Type |
| (K) .....Black Type |

(ST-G45A)

(ST-G45AL)

**Area**

| color | area |
|---|---|
| (S) (K) | (EX).....Continental Europe. (ST-G45A/G45AL) |
| (S) (K) | (EK).....United Kingdom. (ST-G45AL) |
| (S) (K) | (EB).....Belgium. (ST-G45AL) |
| (S) (K) | (EH).....Holland. (ST-G45A) |
| (S) (K) | (EF).....France. (ST-G45AL) |
| (S) (K) | (XA).....Asia, Oceania, Latin America, Middle Near East and Africa. (ST-G45A) |
| (S) (K) | (XL).....Australia. (ST-G45A) |
| (S) (K) | (PA).....For East PX. (ST-G45A) |
| (S) (K) | (PE).....European Military. (ST-G45A) |
| (S) (K) | (EG).....F.R Germany. (ST-G45A) |
| (S) (K) | (Ei).....Italy. (ST-G45A) |

## SPECIFICATIONS

(DIN 45 500)

### ■ FM TUNER SECTION

| | |
|---|---|
| Frequency range | 87.50~108.00 MHz |
| Sensitivity | 1.5 μV (IHF, usable) |
| S/N 30 dB | 1.3 μV (75Ω) |
| S/N 26 dB | 1.2 μV (75Ω) |
| S/N 20 dB | 0.9 μV (75Ω) |
| IHF 46 dB stereo quieting sensitivity | 28 μV/75Ω |
| Total harmonic distortion | |
| MONO (normal) | 0.05% |
| STEREO (normal) | 0.1% |
| S/N | |
| MONO | 72 dB (80 dB, IHF) |
| STEREO | 65 dB (73 dB, IHF) |
| Frequency response | 4 Hz~18 kHz, +0.5 dB~−1.5 dB |
| Alternate channel selectivity | |
| normal ±400 kHz | 65 dB |
| Capture ratio | 1.0 dB |
| Image rejection at 98 MHz | 55 dB |
| IF rejection at 98 MHz | 90 dB |
| Spurious response rejection at 98 MHz | 80 dB |
| AM suppression | 55 dB |
| Stereo separation | |
| 1 kHz | 50 dB |
| 10 kHz | 40 dB |
| Carrier leak | |
| 19 kHz | −55 dB (−60 dB, IHF) |
| 38 kHz | −40 dB (−45 dB, IHF) |
| Channel balance (250 Hz~6,300 Hz) | ±1.0 dB |
| Limiting point | 0.85 μV |
| Bandwidth | |
| IF amplifier | 180 kHz |
| FM demodulator | 1000 kHz |
| Antenna terminals | 75Ω (unbalanced) |

### ■ AM TUNER SECTION (ST-G45A)

| | |
|---|---|
| Frequency range | |
| (For Europe, South Africa and Australia) | |
| | 522 kHz~1611 kHz (9 kHz-step) |
| | 530 kHz~1620 kHz (10 kHz-step) |
| (For Saudi Arabia and others) | |
| | 531 kHz~1602 kHz (9 kHz-step) |
| | 530 kHz~1600 kHz (10 kHz-step) |
| Sensitivity (S/N 20 dB) | 20 μV, 300 μV/m |
| Selectivity at 999 kHz (±9 kHz) | 50 dB |
| Image rejection at 999 kHz | 40 dB |
| IF rejection at 999 kHz | 60 dB |

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku,
Tokyo 105, Japan

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# Service Manual

Tuner

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## QUARTZ Synthesizer LW/MW/FM Stereo Tuner (ST-G45AL)

# ST-G45A
# ST-G45AL

**Color**

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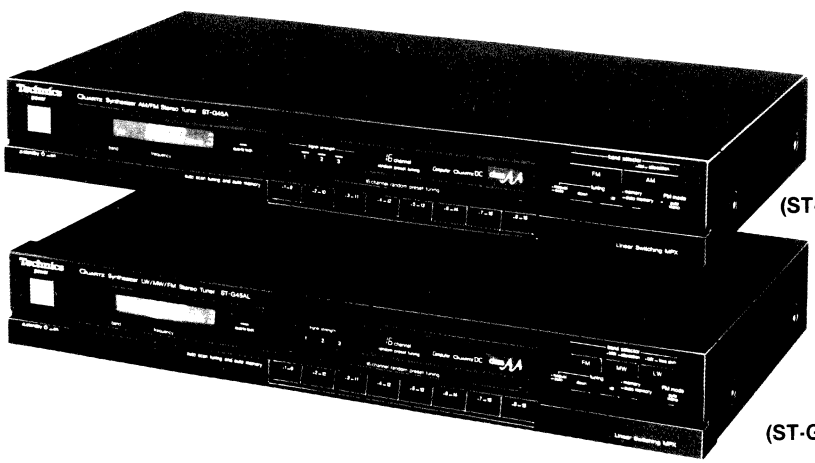
(K) .....Black Type



(ST-G45A)

(ST-G45AL)

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| Stereo separation | |
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| Channel balance (250 Hz−6,300 Hz) | ±1.0 dB |
| Limiting point | 0.85 μV |
| Bandwidth | |
| IF amplifier | 180 kHz |
| FM demodulator | 1000 kHz |
| Antenna terminals | 75Ω (unbalanced) |

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| | |
|---|---|
| Frequency range | |
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| | 522 kHz~1611 kHz (9 kHz-step) |
| | 530 kHz~1620 kHz (10 kHz-step) |
| (For Saudi Arabia and others) | |
| | 531 kHz~1602 kHz (9 kHz-step) |
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| Selectivity at 999 kHz (±9 kHz) | 50 dB |
| Image rejection at 999 kHz | 40 dB |
| IF rejection at 999 kHz | 60 dB |

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Tokyo 105, Japan

## ■ AM TUNER SECTION (ST-G45AL)

| | |
|---|---|
| **Frequency range** | |
| **MW** | 522 kHz~1611 kHz (9 kHz-step) |
| | 530 kHz~1620 kHz (10 kHz-step) |
| **LW** | 155 kHz~353 kHz (9 kHz-step) |
| | 153 kHz~351 kHz (−2 kHz shift) |
| **Sensitivity (S/N 20 dB)** | |
| **MW** | 20 μV, 300 μV/m |
| **LW** | 50 μV |
| **Selectivity (±9 kHz)** | |
| **MW (at 999 kHz)** | 50 dB |
| **LW (at 254 kHz)** | 50 dB |
| **Image rejection** | |
| **MW (at 999 kHz)** | 40 dB |
| **LW (at 254 kHz)** | 40 dB |
| **IF rejection** | |
| **MW (at 999 kHz)** | 60 dB |
| **LW (at 254 kHz)** | 35 dB |

## ■ GENERAL

| | |
|---|---|
| **Output voltage** | 0.3V (0.6V IHF) |
| **Power consumption** | 9W |
| **Power supply** | |
| **For United Kingdom and Australia** | AC 50 Hz/60 Hz, 240V |
| **For continental Europe** | AC 50 Hz/60 Hz, 220V |
| **For others** | AC 50 Hz/60 Hz, 110V/127V/220V/240V |
| **Dimensions (W×H×D)** | 430 × 64 × 241 mm |
| | (16-30/32" × 2-17/32" × 9-1/2") |
| **Weight** | 2.2 kg |
| | (4.84 lb.) |

**Notes:**
- Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).
- Specifications are subject to change without notice. Weight and dimensions shown are approximate.

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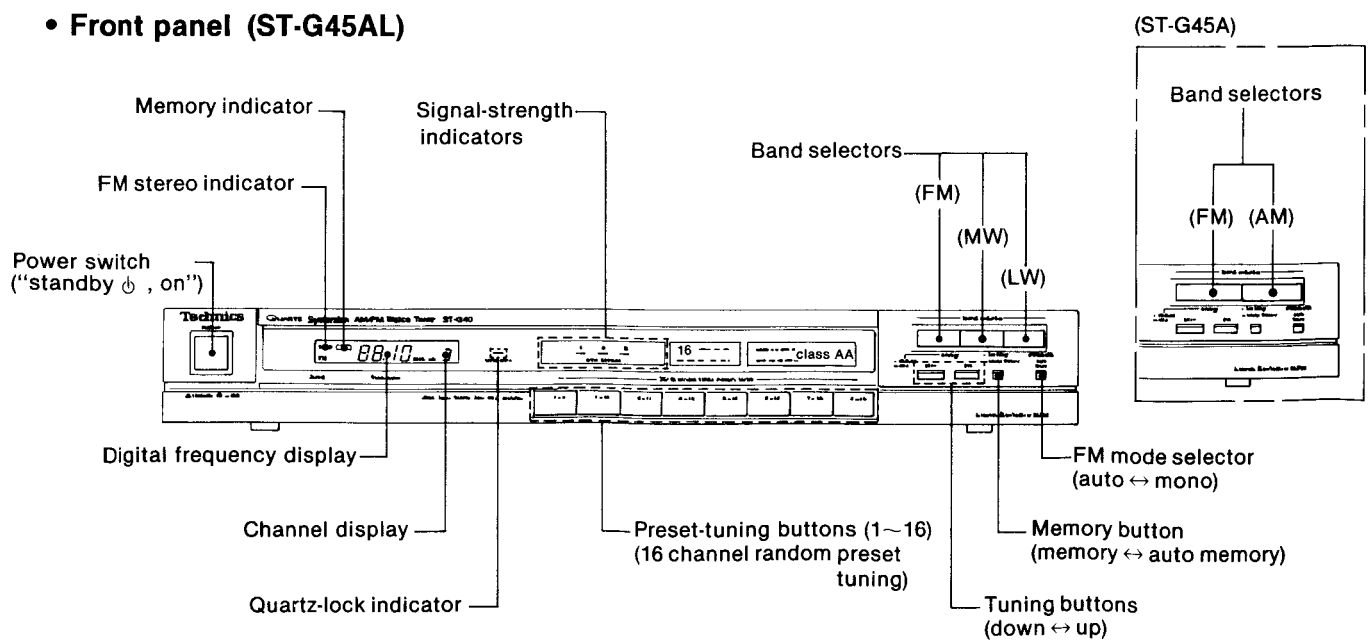
# ■ LOCATION OF CONTROLS

### • Front panel (ST-G45AL)






D

# Tuner

## DEUTSCH

Verwenden Sie bitte diese Broschüre Zusammen mit der Service-Anieitung für das Modell Nr. ST-G45A/G45AL

## ■ MESSUNGEN UND JUSTIERUNGEN

### AM/FM(ST-G45A) LW/MW/FM(ST-G45AL)

**Einstellungen der Bedienelemente und zu verwendende Geräte.**

- MW und UKW Meßsender (MW und UKW Nebsender)
- Stereo-Modulator
- Verzerrungs-Analystator
- Elektronische Wechselstrom-und Gleichstrom-Voltmeter(EVM)
- Keramischer Kondensator(200pF)
- Oszilloskop
- Frequenzzähler
- Drosselspule(100μH)
- Widerstand(100KΩ)

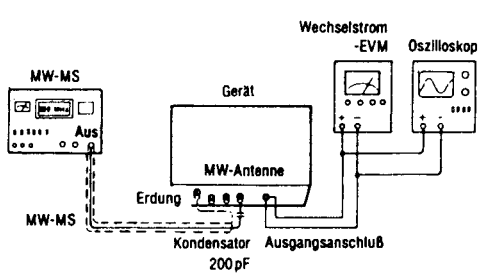
**Anmerkung:** Für **T201** (AM ZFT), **L203** (AM (MW)-OSZ, -Spule), **L251** (LW-Antennenspule), **L303** (L.P.F.) und **L301, L302** (L.P.F.), werdeven justiert Ersatzteil geliefert. Dien Kern dieses Teils daher nicht drehen.

### AM(MW)-HF-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf **"AM(MW)"** Betrieb.
3.Radio und Signalgenerator auf **612kHz** einstellen.
4.**L202** auf maximale Ausgangsleistung adgleichen.
5.Radio und Signalgenerator auf **1503kHz** einstellen.
6.**CT201** auf maximale Ausgangsleistung abgleichen.
7.Die Schritte 3 ~ 6 wiederholen.

**Anmerkung:**
Der Antenneneingang-Signalpegel muß so niedrig wie möglich und frei von automatischer werstärkungsregelung (AGC) sein.

ZUSTAND DES MW-MESSENDERS
Modulation .....30%
Modulationsfrequenz .....400Hz

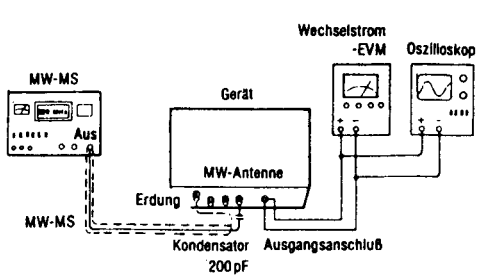



### LW-HF-JUSTIERUNG (Nur ST-G45AL)

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf **"LW"** Betrieb.
3.Die Radiofrequenzanzeige und den Messender auf **155kHz** einstellen.
4.**L252** auf maximale Ausgangsleistung abgleichen.
5.Die Radiofrequenzanzeige und den Messender auf **353kHz** einstellen.
6.**CT251** auf maximale Ausgangsleistung abgleichen.
7.Die Schritte 3 ~ 6 wiederholen.

**Anmerkung:**
Der Antenneneingang-Signalpegel muß so niedrig wie möglich und frei von automatischer werstärkungsregelung (AGC) sein.

ZUSTAND DES MW-MESSENDERS
Modulation .....30%
Modulationsfrequenz .....400Hz

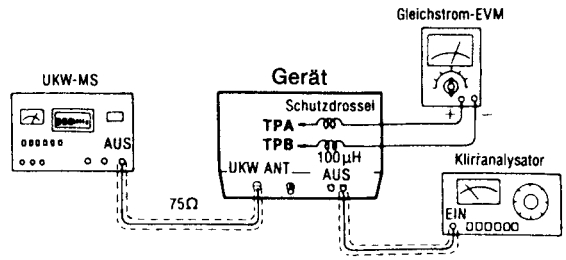


## UKW-MONO-VERZERRUNGS-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf **"FM(UKW)"** Betrieb.
3.Die Radiofrequenzanzeige und den Messender auf **100.10MHz** einstellen.
4.Den Kern von **T101** so justieren, daß die im Signalzustand gemessene Spannung **0mV (0±10mV)** im 150mV-Bereich beträgt.
5.**T102** so justieren, daß der Verzerrungsfaktor des linken Kanals minimal wird.
6.Schritte 4 und 5 einige Male wiederholen.
7.Versichern Sie sich, daß die Verzerrungsfaktoren von Kanal L und Kanal R annähernd gleich sind und auf ein Minimum gehalten sind.

**Anmerkung:**
Für die Justierung ist ein Schraubendreher aus Kunststoff zu verwenden.

ZUSTAND DES UKW-MESSENDERS
Modulation .....100%
Modulationsfrequenz .....1kHz
Ausgangspegel .....66dB




TPA = TP102, TPB = TP101

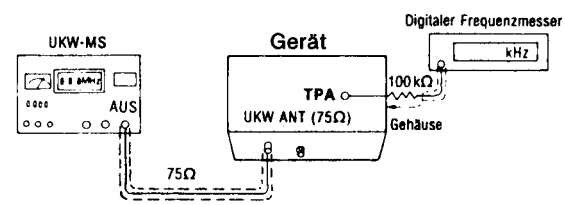
## MPX-SGO-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Den UKW-Bertriebsart-Wahlshalter in die **"on/auto"** Position stellen.
3.Radio und Meßsender auf **100.10MHz** einstellen.
4.**VR302** auf **19kHz** ± **30Hz** auf der Frequenzzähleranzeige justieren.

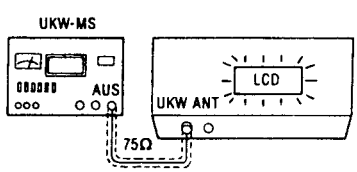
### ● VERWENDUNG EINES ALTERNATIVSYSTEMS

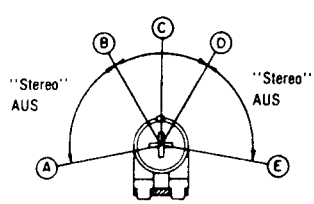
1.Stereosignal vom Meßsender eingeben oder eine Stereo-Sendung empfangen.
2.**VR302** justieren, bis die Stereo-Anzeige aufleuchtet. Den Arm von **VR302** mit Lack sichern, wie in der Abbildung gezeigt.

ZUSTAND DES UKW-MESSENDERS
Modulation .....0%
Modulationsfrequenz .....0
Ausgangspegel .....66dB




TPA = TP301, Digitaler Frequenzmesser:19.00 kHz



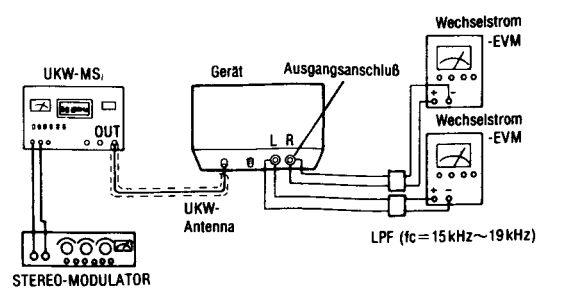

VR302

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... "Stereo" AUS Stellung
Ⓑ−Ⓓ..... "Stereo" EIN Stellung
(Anzeigebeleuchtung)
Ⓒ..... Einstellpunkt des pilotschaltkreis'

## TRENNUNGS-JUSTIERUNG

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf **"FM"** Betrieb.
3.Die Radiofrequenzanzeige und den Messender auf **100,10MHz** einstellen.
4.**VR301** so justieren, daß der R-Ausgang minimal ist, wenn der Stereomodulator im L-Betriebszustand (Linker Kanal moduliert) ist.

ZUSTAND DES UKW-MESSENDERS
Modulation ....."L"order "R" Betriebsart
45%,Pilotssignal 10%
Modulationsfrequenz .....1kHz(Pilot 19kHz)
Ausgangspegel .....66dB



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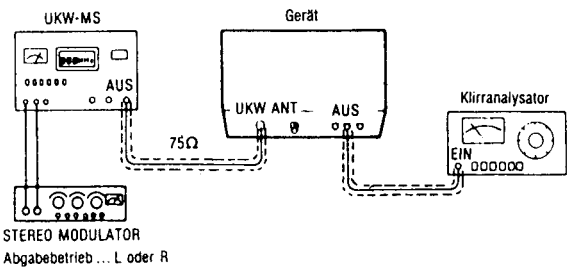
### UKW STEREO KLIRRFAKTOR-JUSTIERUNG (Nur [EG])

1.Der Testaufbau ist in der Abbildung gezeigt.
2.Stellen Sie die Einheit auf "**FM(UKW)**" Betrieb.
3.Die Radiofrequenzanzeige und den Messender auf **100.10MHz** einstellen.
4.**T1** so justieren, daß der Verzerrungsfaktor des linken Kanals minimal wird.
5.überprüfen, daß die Verzerrungsfaktoren des linken und rechten Kanals fast gleich sind.

**Anmerkung:**
Für die Justierung ist ein Schraubendreher aus Kunststoff zu verwenden.

ZUSTAND DES UKW-MESSENDERS
Modulation .....”L”order ”R” Betriebsart 45%,Pilotssignal 10%
Modulationsfrequenz .....1kHz(Pilot 19kHz)
Ausgangspegel .....66dB




# FRANÇAIS

Ceci est à utiliser conjointement avec manuel d'entretien du modèle No. ST-G45A,G45AL

## ■ MEAURAGES ET REGLAGES

**A.M./M.F. (ST-G45A)**
**LW/MW/M.F. (ST-G45AL)**

**Positionnements des commandes et équipement utilisé**

- Générateur de signaux AM et FM (AM et FM-SG)
- Modulateur stéréophonique
- Analyseur de distorsion
- Oscilloscope
- Compteur de fréquence
- Bobine d'amortissement d'arrêt (100μH)
- Résistance (100kΩ)
- Condensateur céramique (200pF)
- Voltmètre électronique à C.A. et C.C. (EVM).

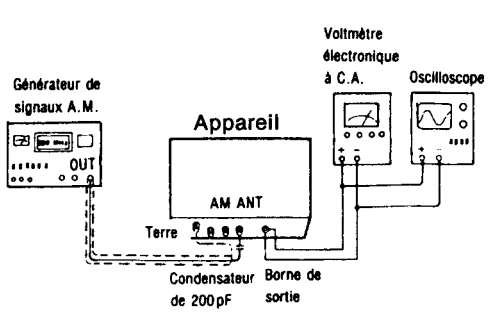
**Nota:** Pour **T201** (A.M.) F.I., **L203** (bobine oscil. de AM (MW), **L251** (bobine ANT LW), **L303** (L.P.F.) et **L301**, **L302** (L.P.F.), des éléments réglés sont fournis. Aussi, ne pas tourner les noyaux de ces pièces.

### REGLAGE DE O.M.-H.F.

1.Le raccordement de l'équipement d'essai est montré sur l'illustration.
2.Régler l'appareil sur le mode "**AM(MW)**".
3.Régler le cadran radio et le générateur de signaux sur **612kHz**.
4.Régler **L202** pour une sortie maximale.
5.Régler le cadran radio et le générateur de signaux sur **1503kHz**.
6.Régler **CT201** pour une sortie maximale.
7.Répéter les étapes 3 ~ 6.

**Nota:** Le niveau d'entrée d'antenne doit être aussi bas que possible étant libéré de la commande automatique de gain.

CONDITION DU GENERATEUR DE SIGNAUX AM
Modulation .....30%
Modulationsfrequenz .....400Hz

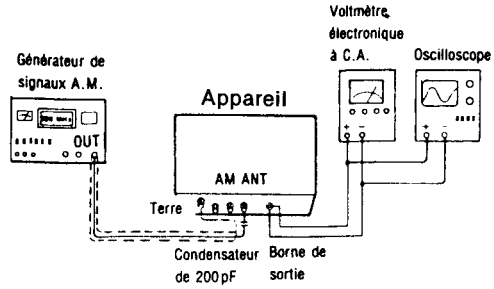


## REGLAGE DE RE-LW (ST-G45AL seulement)

1.Le raccordement de l'équipement d'essai est montré sur l illustration.
2.Régler l'appareil sur le mode **"LW"**.
3.Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **612kHz.**
4.Régler **L252** pour une sortie maximale.
5.Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **353kHz.**
6.Régler **CT251** pour une sortie maximale.
7.Répéter les étapes 3 ~ 6.

**Nota:** Le niveau d entrée d'antenne doit étre aussi bas que possible étant libéré de la commande automatique de gain.

CONDITION DU GENERATEUR
DE SIGNAUX AM
Modulation .....30%
Modulationsfrequenz .....400Hz

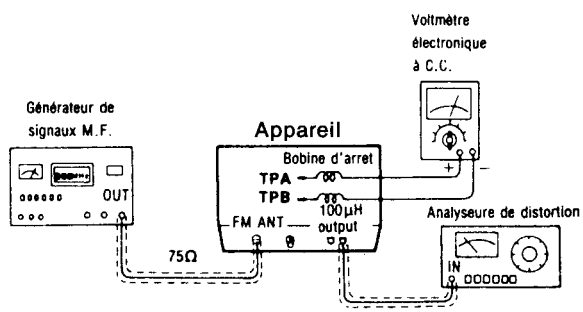



## REGLAGE DE DISTORSION MONOPHONIQUE M.F.

1.Le raccordement de l'équipement d'essai est montré sur l'illustration.
2.Régler l'appareil sur le mode **"FM"**.
3.Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **100.10MHz**.
4.Régler le noyau de **T101** de telle sorte que la tension mesurée sur le mode de signaux soit de **0mV(0±10mV)** dans une plage de.150mV.
5.Ajuster **T102** de telle que le facteur de sistorsion du canal de gauche soit minimisé.
6.Répéter les étapes 4 et 5 quelques fois.
7.S'assurer que les facteurs de distorsion du canal de gauche et du canal de droite soient sensiblement les mêmes et au minimum.

**Nota:** Le tournevis de réglage utilisé devra être fait en résines.

CONDITION DU GENERATEUR DE SIGNAUX M.F.
Modulation .....100%
Fréquenz de modulation....1kHz
Niveau de sortie.....66dB




TPA = TP102, TPB = TP101

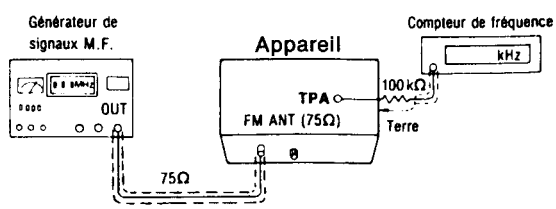
## REGLAGE MULTIPLEX DE L'OSCILLATEUR COMMANDE PAR VARIATION DE TENSION

1.Le raccordement de l'équipement d'essai est montré sur la figure.
2.Régler l'appareil sur la position **"on/auto"**.
3.Régler le cadran radio et le générateur de signaux sur **100.10MHz**.
4.Ajuster **VR302** pour **19kHz ± 30Hz** sur le compteur de lecture de fréquences.

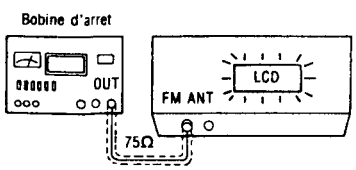
### ● EN UTILISANT UN SYSTEME ALTERNATIF

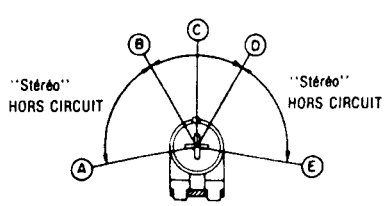
1.Applique un signal stéréo à partir du générateur ou recevoir une émission stéréo.
2.Ajuster **VR302** jusqu' à ce que l'indicateur stéréo s éclaire. Coller le bras de **VR302** comme il montré sur la figure.

CONDITION DU GENERATEUR DE SIGNAUX M.F.
Modulation .....0%
Fréquenz de modulation....0
Niveau de sortie.....66dB




TPA = TP301
Compteur de fréquence:19.00 kHz



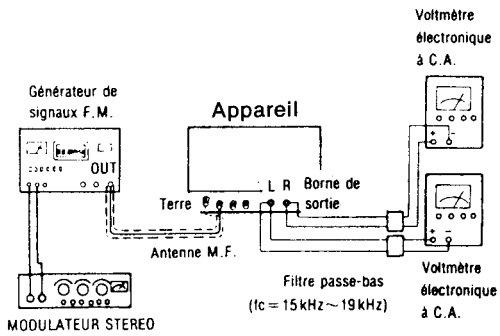

VR302

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... Position de HORS CIRCUIT "Stereo".
Ⓑ−Ⓓ..... Position de MISE EN CIRCUIT "Stereo".
(Eciairage de l'indicateur)
Ⓒ..... Point de réglage du circuit pilote.

## REGLAGE DE SEPARATION

1.Le raccordement de l'équipement d'essai est montré sur l'illustration.
2.Régler l'appareil sur le mode **"FM"**.
3.Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **100,10MHz**.
4.Ajuster **VR301** de telle sorte que la sortie de droite soite minimisée lorsque le modulateur stéréo est sur le mode **"G"**. (modulation de canal de gauche.)

CONDITION DU GENERATEUR DE SIGNAUX M.F.
Modulation .....Mode"G" ou mode"D" à 45%, Signal de commande à 10%
Fréquenz de modulation ....1kHz,Pilot(19kHz)
Niveau de sortie.....66dB

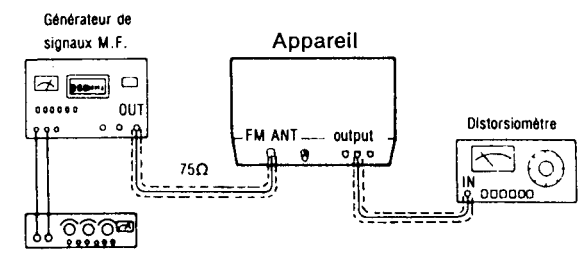



## AJUSTEMENT DE LA DISTORSION STEREO FM ([EG] seulement)

1.Le raccordement de l'équipement d'essai est montré sur l'illustration.
2.Régler l'appareil sur le mode **"FM"**.
3.Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **100.10MHz**.
4.Ajuster **T1** de telle que le facteur de distorsion du canal de gauche soit minimisé.
5.Sássurer que les facteurs de distorsion du canal de gauche et du canal de droite soient sensiblement les mêmes l'un par rapport à l'autre.

**Nota:** Le tournevis de réglage utilisé devra être fait en résines.

CONDITION DU GENERATEUR DE SIGNAUX M.F.
Modulation .....Mode"G" ou mode"D" à 45%, Signal de commande à 10%
Fréquenz de modulation ....1kHz,Pilot(19kHz)
Niveau de sortie.....66dB



# ESPAÑOL

Sirvase utilizarse junto con manual de servicio para el model No. ST-G45A,G45AL

## ■ MEDICIONES Y AJUSTES

**AM/FM(ST-G45A) LW/MW/FM(ST-G45AL)**

**Posiciones de control y equipo usado.**

- Generador de señales de AM y FM (AM y FM-SG)
- Voltimetro electrónico de CA y CC(EVM)
- Analizador de distorsiones
- Osciloscopio
- Frecuencimetro
- Frecuencimetro
- Bobina de choque(100μH)
- Resistor(100kΩ)
- Condensador cerámico(200pF)

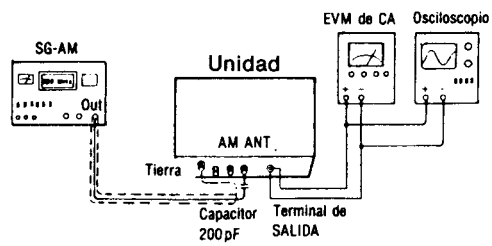
**Nota:** Para **T201** (AM-IFT), **L203** (bobina de OSC. AM (MW)), **L251** (bobina antena LO), **L303** (L.P.F.) y **L301**, **L302** (L.P.F.) son suministradas piezas ajustadas. Por lo tanto, no gire los núcleos de estas piezas.

### AJUSTE DE AM(MW)-RF

1.La conexión del equipo de pruebas se muestra en la figura.
2.Poner la unidad en modalidad de **"AM"**.
3.Poner la presentación de la radio y el generador de señales en **612kHz**.
4.Ajustar **L202** para salida máxima.
5.Poner la presentación de la radio y el generador de señales en **1503kHz**.
6.Ajustar **CT201** para salida máxima.
7.Repita los pasos 3. al 6.

**Nota:**
El nivel de entrada de antena ha de ser lo más bajo posible estando libre de AGC (control automático de ganancia).

CONDICION DE GENERADOR DE SEÑALES DE AM
Modulación .....30%
Frecuencia de modulación .....400Hz

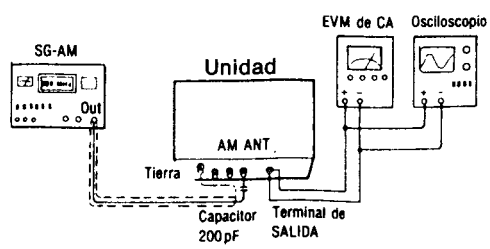



### AJUSTE DE LO-RF (Sólo ST-G45AL)

1.La conexión del equipo de pruebas se muestra en la figura.
2.Poner la unidad en modalidad de **"LW"**.
3.Poner la puesta de la presentación de radiofrecuenciay generador de señales a **155kHz**.
4.Ajustar **L252** para salida máxima.
5.Poner la puesta de la presentación de radiofrecuenciay generador de señales a **353kHz**.
6.Ajustar **CT251** para salida máxima.
7.Repitir los pasos 3. al 6.

**Nota:**
El nivel de entrada de antena ha de ser lo más bajo posible estando libre de AGC (control automático de ganancia).

CONDICION DE GENERADOR DE SEÑALES DE AM
Modulación .....30%
Frecuencia de modulación .....400Hz





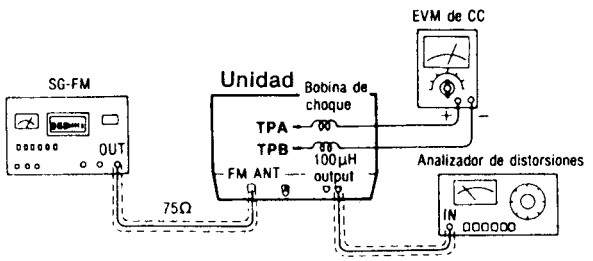

D

## AJUSTE DE DISTORSION MONO FM

1.La conexión del equipo de pruebas se muestra en la figura.
2.Poner la unidad en modalidad de **"FM"**.
3.Poner la puesta de la presentación de radiofrecuencia y generador de señales a **100,10MHz.**
4.Ajustar el núcleo de **T101** de manera que el voltaje medido en modalidad de señal sea 0mV (0±10mV).
5.Ajustar **T102** de manera que el factor de distorsión de CH-I se minimice.
6.Repetir los pasos 4 y 5 algunas veces.
7.Asegurarse de que los factores de distorsión de CH-I y CH-D sean casi los mismos y los mínimos.

**Nota:**
El destornillador de ajuste usado debe estar hecho de resina.

CONDICION DE GENERADOR DE SEÑALES DE FM
Modulación .....100%
Frecuencia de modulación .....1kHz
Nivel de salida .....66dB



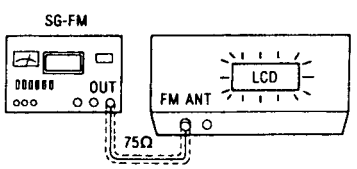

TPA = TP102, TPB = TP101

## AJUSTE DE MPX VCO(OSCILADOR CONTROLADO POR VOLTAJE MPX)

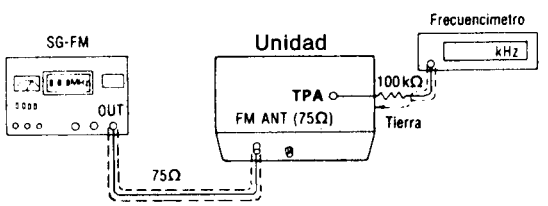
1.La conexión del equipo de pruebas se muestra en la figura.
2.Poner la unidad en la posición de **"on/auto"**.
3.Poner la presentación de la radio y la puesta del generador de señales en **100.10MHz**.
4.Ajustar **VR302** para **19kHz±30Hz** en lectura de frecuencímetro.

### * USANDO SISTEMA ALTERNATIVO

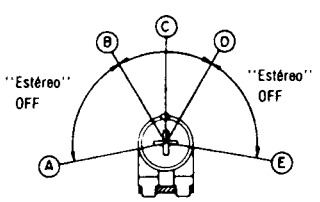
1.Aplicar señal estereofónica del generador o recibir la emisión estereofónica.
2.Ajustar **VR302** hasta que la presentacón de estéro se encienda. Fijar el brazo de **VR302** como se muestra en la figura.




CONDICION DE GENERADOR DE SEÑALES DE FM
Modulación .....0%
Frecuencia de modulación .....0
Nivel de salida .....66dB




TPA = TP301, Frecuencimetro:19.00 kHz



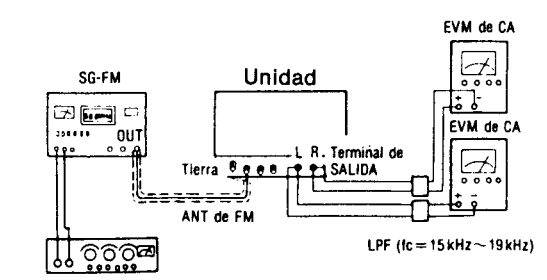

VR302

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... Pósición de "estéreo" OFF.
Ⓑ−Ⓓ..... Pósición de "estéreo" ON. (Indicador encendido)
Ⓒ..... Punto de ajuste de circuito piloto.

## AJUSTE DE SEPARACION

1.La conexión del equipo pruebas se muestra en la figura.
2.Poner la unidad en modalidad de **"FM"**.
3.Poner la puesta de la presentación de radiofrecuencia y generador de señales a **100,10MHz**.
4.Ajustar **VR301** de manera que la salida de D quede minimizada cuando el modulador de estéreo esté en la modalidad "I". (modulación de CH-I.)

CONDICION DE GENERADOR DE SEÑALES DE FM
Modulación .....Modalidad de "I" o modalidad de "D" 45%, Piloto 10%
Frecuencia de modulación....1kHz, Piloto(19kHz)
Nivel de salida .....66dB

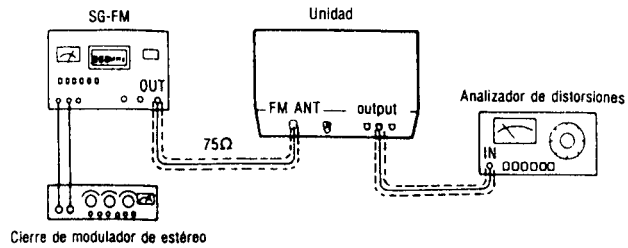


## AJUSTE DE DISTORSION DE ESTEREO EN FM (Sólo [EG])

1.La conexión del equipo de pruebas se muestra en la figura.
2.Poner la unidad en modalidad de "**FM**".
3.Poner la puesta de la presentación de radiofrecuencia y generador de señales a **100,10MHz.**
4.Ajustar **T1** de manera que el factor de distorsión de CH-I se minimice.
5.Asegurarse de que los factores de distorsión de CH-I y CH-D sean casi los mismos uno con el otro.

**Nota:**
El destornillador de ajuste usado debe estar hecho de resina.

CONDICION DE GENERADOR DE SEÑALES DE FM
Modulación.....Modalidad de "I" o modalidad de "D" 45%, Piloto 10%
Frecuencia de modulación....1kHz, Piloto(19kHz)
Nivel de salida.....66dB

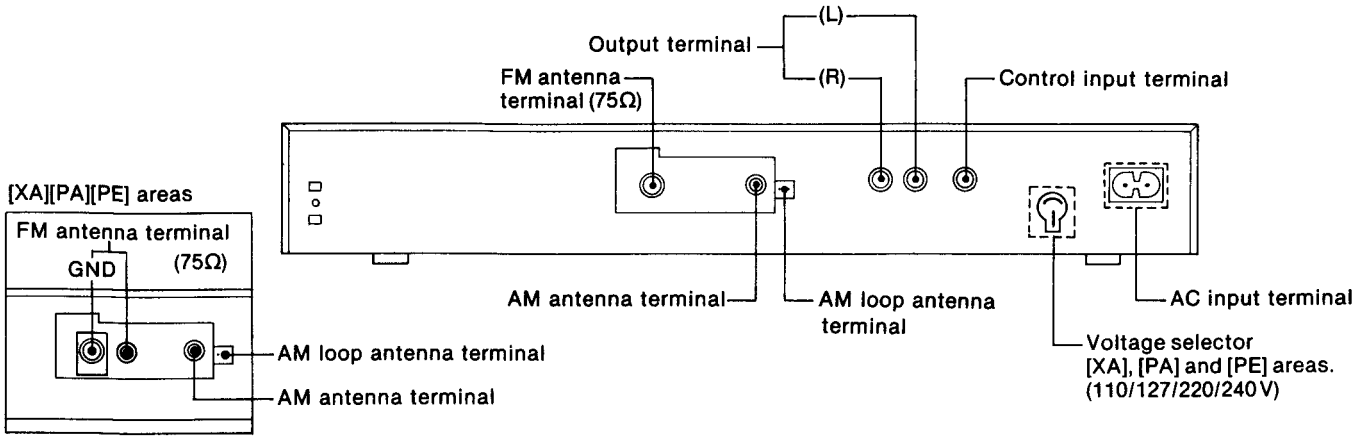


Cierre de modulador de estéreo



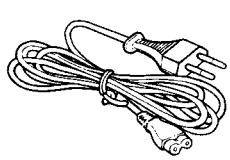
Printed in Japan
H870505000 YY/MT

## • Rear panel

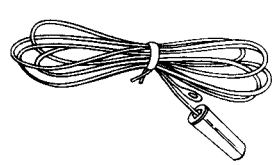



# ■ ACCESSORIES

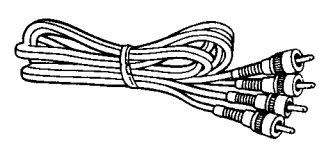
- AC power supply ..... 1
  (SFDAC05E03 [EX, EF, EB, EH, EG, Ei])
  (SFDAC05G02 [EK])
  (SJA163 [XL])
  (SJA168-1 [XA, PA, PE])



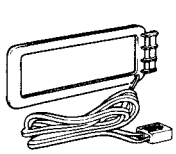
- FM indoor antenna ..... 1
  (SSA270M [EX, EK, EF, EB, EH, EG, Ei])
  (SSA269M [XL, XA, PA, PE])



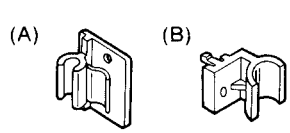
- Stereo connection cable ..... 1
  (SJP2249-1)



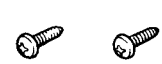
- AM loop antenna ..... 1
  (SPB1152T)



- AM antenna holders ..... 2
  (SMA231M) (SMA233-1M)

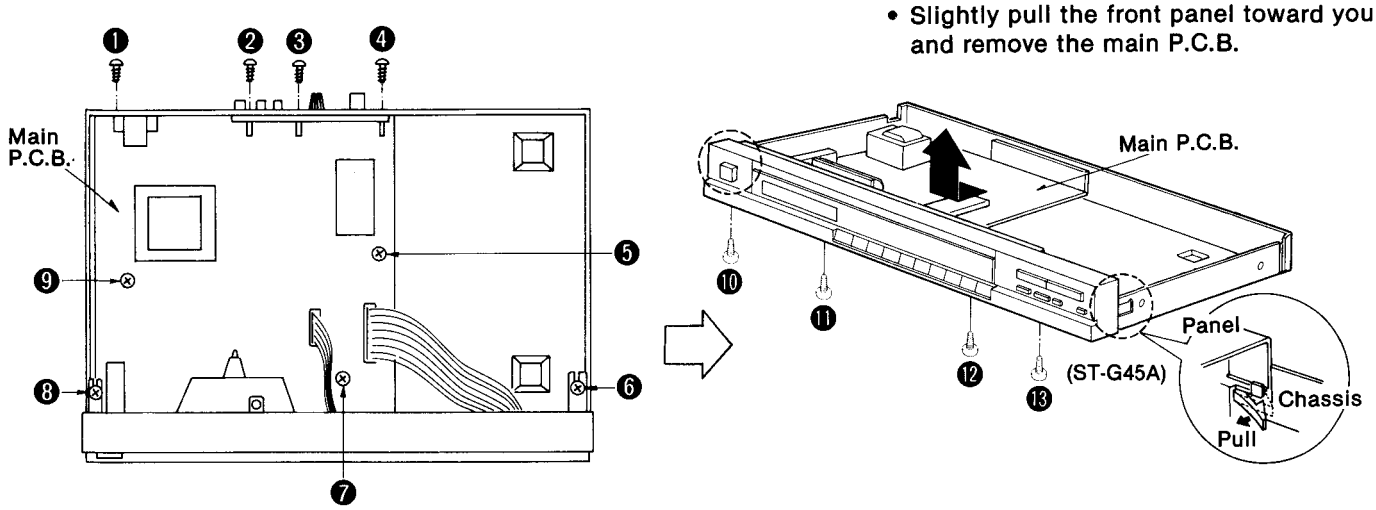



- Screws ..... 2
  (XTN3+10AFZ)

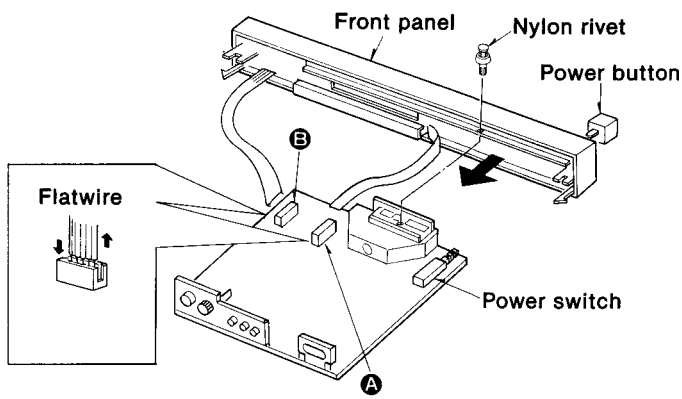


# ■ DISASSEMBLY INSTRUCTIONS

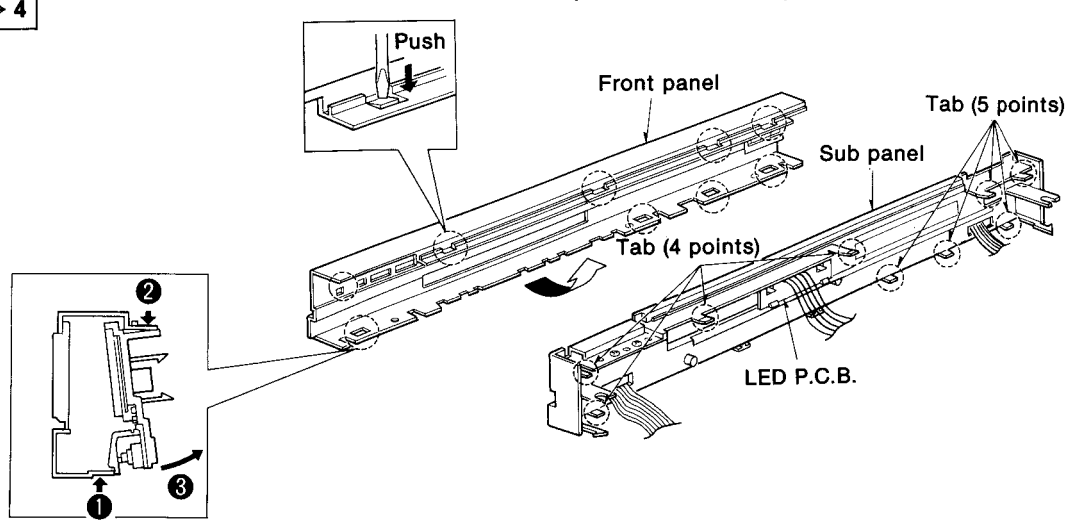
| Ref. No. 1 | How to remove the cabinet | Ref. No. 2 | How to remove the main P.C.B. |
|---|---|---|---|
| Procedure 1 | • Remove the 4 screws. | Procedure 1 → 2 | • Remove the 9 screws (❶~❾).<br>• Remove the 4 screws (❿~⓭).<br>• Slightly pull the front panel toward you and remove the main P.C.B. |




| Ref. No. 3 | How to remove the front panel |
|---|---|
| Procedure 1 → 2 → 3 | • Remove the power button.<br>• Remove the 1 Nylon rivet.<br>• Remove the 2 flatwires (Ⓐ, Ⓑ). |



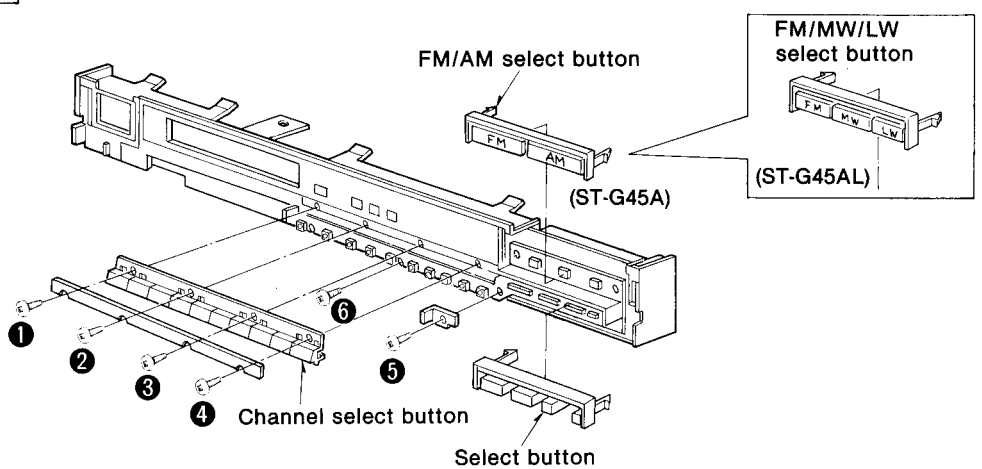

| Ref. No. 4 | How to remove the sub panel |
|---|---|
| Procedure 1 → 2 → 3 → 4 | • Push out the 9 tabs on the bottom and top side of the sub panel by used minusdriver. |






D

| Ref. No. 5 | How to remove the FM/AM (MW/LW) Channel switch |
|---|---|
| Procedure 1 → 2 → 3 → 4 → 5 | • Remove the 6 screws (❶~❻). |




## ■ MEASUREMENTS AND ADJUSTMENTS

### ■ AM/FM(ST-G45A) LW/MW/FM(ST-G45AL)

**Control positions and equipment used**

- AM and FM signal generator(AM and FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- Frequency counter
- Choke coil (100μH)
- Resistor(100kΩ)
- Ceramic capacitor(200pF)
- AC and DC electronic voltmeter(EVM)

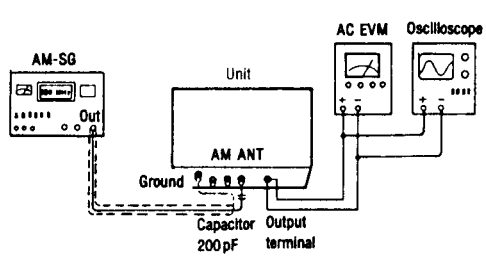
**Note:** For **T201** (AM (MW)-IFT), **L203** (AM (MW) OSC coil), **L251** (LW ANT coil), **L303** (L.P.F.) and **L301**, **L302** (L.P.F.), they are supplied as adjusted parts. So, do not turn the cores of the parts.

**AM(MW)-RF ADJUSTMENT**

1.Test equipment connection is shown in figure.
2.Set the unit to **"AM(MW)"** mode.
3.Set the radio and signal generator to **612kHz**.
4.Adjust **L202** for maximum output.
5.Set the radio dial and signal generator to **1503kHz**.
6.Adjust **CT201** for maximum output.
7.Repeat steps 3 ~ 6.

**Note:** Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation .....30%
Modulation frequency .....400Hz

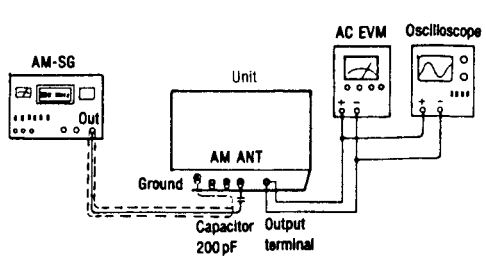



**LW-RF ADJUSTMENT (ST-G45AL only)**

1.Test equipment connection is shown in figure.
2.Set the unit to **"LW"** mode.
3.Set the radio frequency display and signal generator to **155kHz**.
4.Adjust **L252** for maximum output.
5.Set the radio frequency display and signal generator to **353kHz**.
6.Adjust **CT251** for maximum output.
7.Repeat steps 3 ~ 6.

**Note:** Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation .....30%
Modulation frequency .....400Hz

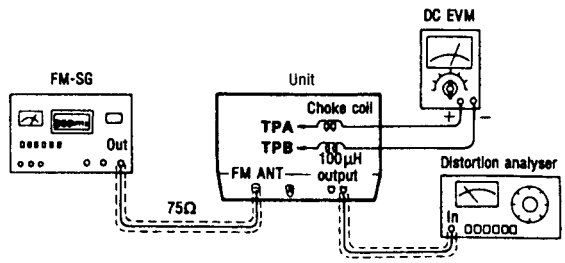


## FM MONO DISTORTION ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"FM"** mode.
3.Set the radio frequency display and signal generator to **100.10MHz.**
4.Adjust the core of **T101** so that the voltage measured in signal mode is **0mV(0±10mV)** in 150mV range.
5.Adjust **T102** so that the distortion factor of L-CH is minimized.
6.Repeat steps 4 and 5.
7.Make sure that the distortion factors of L-CH and R-CH are nearly the same and minimum.

**Note:** The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation .....100%
Modulation frequency .....1kHz
Output level .....66dB




**TPA = TP102, TPB = TP101**

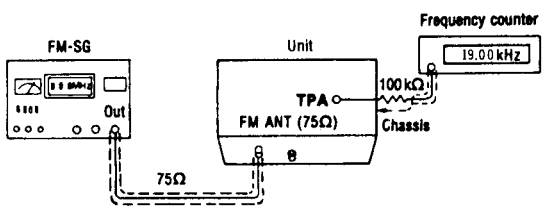
## MPX VCO ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"on/auto"** position.
3.Set the radio dial and signal genarator to **100.10MHz.**
4.Adjust **VR302** for **19kHz±30Hz** on frequency counter reading.

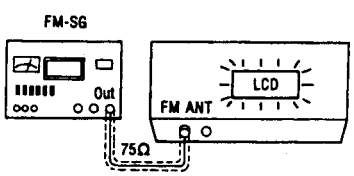
### USING ALTERNATE SYSTEM

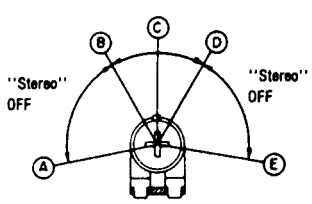
1.Apply stereo signal from generator or receive the stereo broadcast.
2.Adjust **VR302** until stereo indicator lights up. Fix the arm of **VR302** as shown in figure.

FM SIGNAL GENERATOR CONDITION
Modulation .....0%
Modulation frequency .....0
Output level .....66dB




TPA = TP301, Frequency counter:19.00 kHz



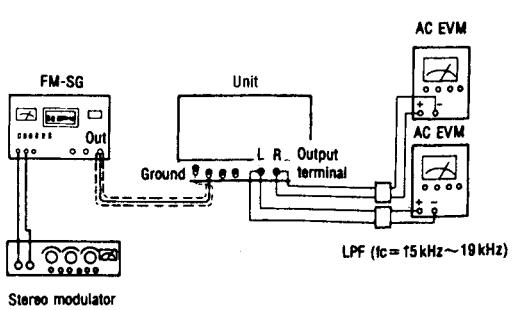

VR302

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... **"Stereo" OFF position**
Ⓑ−Ⓓ..... **"Stereo" ON position (Indicator lighting)**
Ⓒ..... **Adjust point of pilot circuit**

## SEPARATION ADJUSTMENT

1.Test equipment connection is shown in figure.
2.Set the unit to **"FM"** mode.
3.Set the radio frequency display and signal generator to **100.10MHz.**
4.Adjust **VR301** so that the R-CH output is minimized when stereo modulator is in "L"(L-CH modulation) mode.

FM SIGNAL GENERATOR CONDITION
Modulation.....L"mode or "R"mode 45%, Pilot 10%
Modulation frequency .....1kHz(Pilot 19kHz)
Output level .....66dB





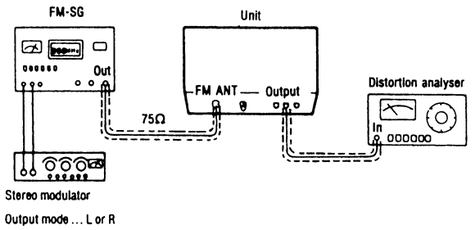

D

**FM STEREO DISTORTION ADJUSTMENT ([EG] only)**

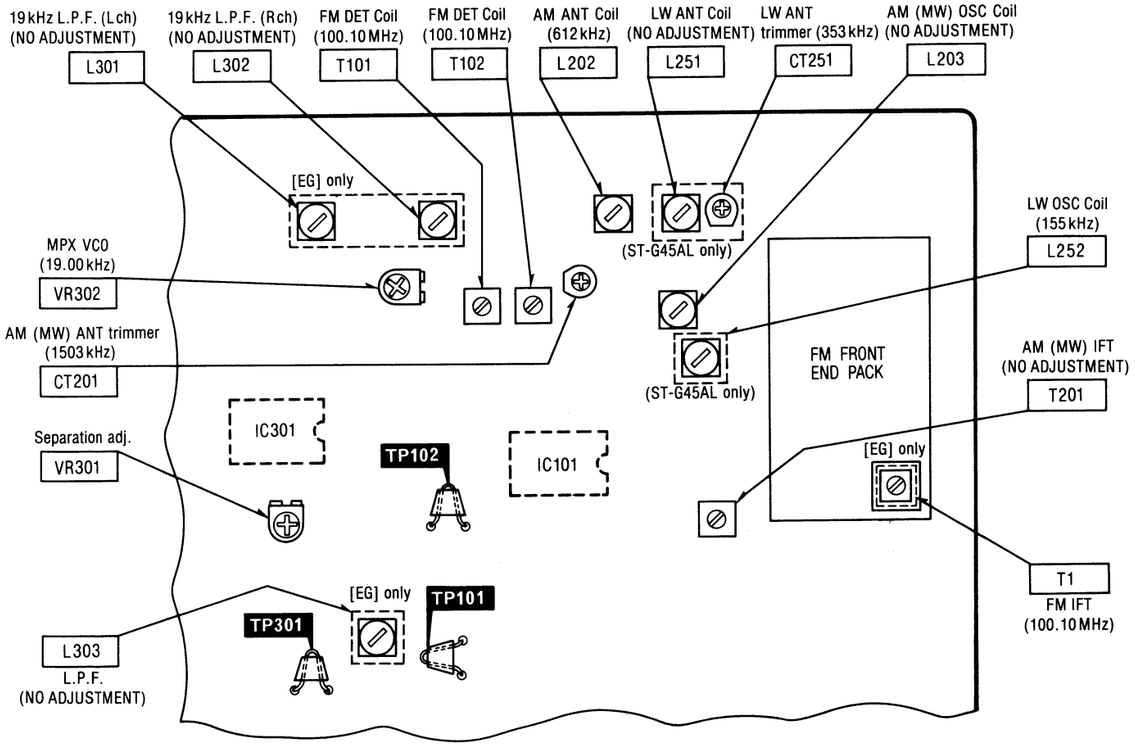
1.Test equipment connection is shown in figure.
2.Set the unit to **"FM"** mode.
3.Set the radio frequency display and signal generator to **100.10MHz**.
4.Adjust **T1** so that the distortion factor of L-CH is minimized.
5.Make sure that the distortion factors of L-CH and R-CH are nearly the same with each other to minimum.

**Note:** The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation .....”L”mode or ”R”mode 45%, Pilot 10%
Modulation frequency .....1kHz(Pilot 19kHz)
Output level.....66dB




## • Adjustment Points





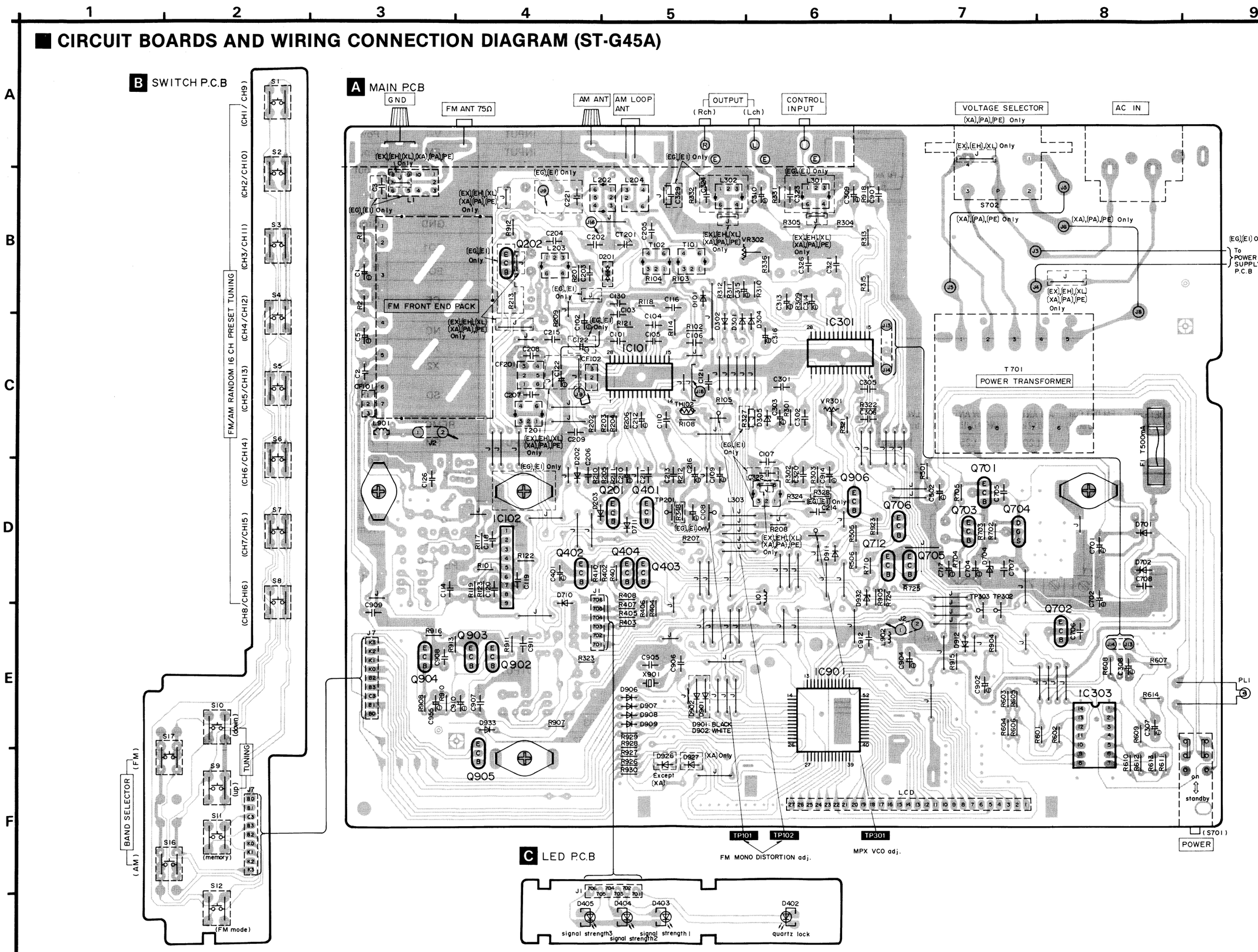

# ■ FUNCTION OF TERMINAL (IC901: UPD1718G514)

| PIN NO. | IN/OUT | MARK | DESCRIPTION OF TERMINAL |
|---|---|---|---|
| 1~4 | OUTPUT | LCD4~LCD1 | Segment signal output for LCD display. |
| 5 | OUTPUT | COM2 | Common of LCD. 5V / 2.5V / 0, 5msec. |
| 6 | | COM1 | |
| 7 | INPUT | $V_{DD}$ | Power supply terminal. |
| 8 | INPUT | FM | Input for FM OSC output frequency divided to 1/32 or 1/33 by pre-scaler. |
| 9 | INPUT | AM | Input for AM OSC output. 1.84V, 1.87V, 522kHz, 1629kHz |
| 10 | —— | GND | Ground terminal. |
| 11 | OUTPUT (ST-G40L only) | EO1 | Error output of PLL. The frequency is output as a result of comparison between crystal frequency and FM or AM (MW/LW) station frequency. |
| 12 | OUTPUT | EO2 | |
| 13 | INPUT | CE | Power supply detection. "H" input with it connected to home-use power outlet socket. H → 4V, L → 0V |
| 14 | —— | NC | Not used in this unit. |
| 15 | OUTPUT | X1 | Connecting terminal for crystal oscillator. The crystal connected is at 4.5MHz. |
| 16 | INPUT | X2 | |
| 17 | INPUT | SD | Station detection. 1. Signal received → H 2. NO signal → L |
| 18 | INPUT | REMOTE | Remote control input terminal. |
| 19 | OUTPUT | FM | "H" output in FM mode. |
| 20 | OUTPUT | LW. FM MONO | Forcible monaural selection. 4.8V / 0V — Forcible monaural mode |
| 21~24 | INPUT | K3~K0 | Input terminal for key return signal from external key matrix. |
| 25~28 | OUTPUT | PB3~PB0 | Output terminal for key source signal data. |
| 29~31 | | PC3~PC1 | |
| 32 | OUTPUT | MUTE | This is the output terminal to eliminate shock noise due to unlocking at PLL. <Muting output> 1. Pin 13 (CE) is L → H or H → L. 2. Power switch "off". 3. Frequency change. (up/down, FM ↔ AM) 4. FM IF selection. 5.0V / 0V — Muting output operation |
| 33 | INPUT | $V_{DD}$ | Power supply terminal. |
| 34~52 | OUTPUT | LCD23~LCD5 | Segment signal output for LCD display. |

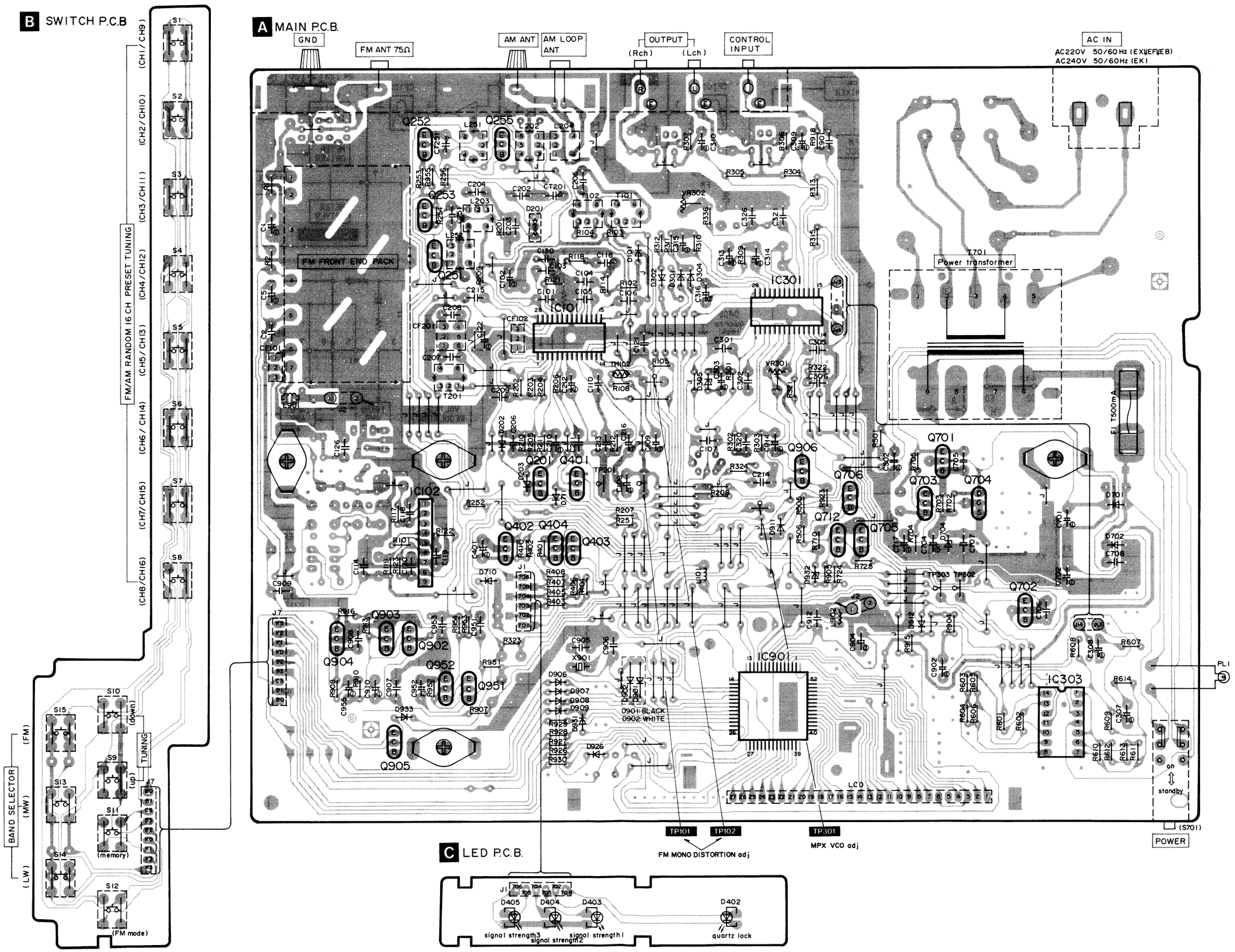
[KEY MATRIX]

| Pin No. | 25 | 26 | 27 | 28 | 29 |
|---|---|---|---|---|---|
| 21 | up | MW (AM) | CH5 /13 | CH1 /9 | — |
| 22 | down | LW | CH6 /14 | CH2 /10 | — |
| 23 | — | FM | CH7 /15 | CH3 /11 | memo |
| 24 | — | mode | CH8 /16 | CH4 /12 | — |

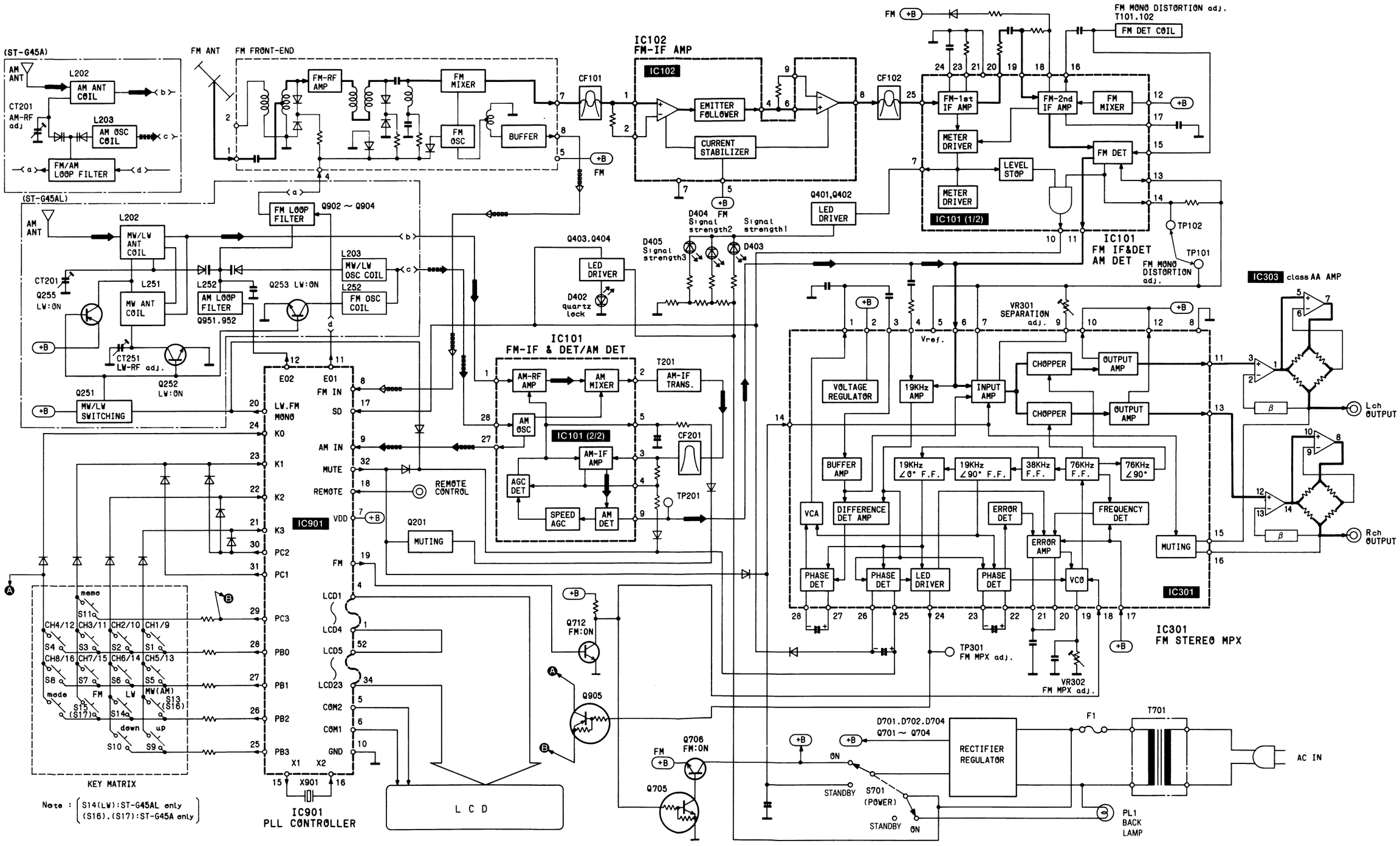
# ■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (ST-G45A)



# ■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (ST-G45AL)



## ■ BLOCK DIAGRAM



# ■ RESISTORS & CAPACITORS

**Notes:** * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

**Numbering System of Resistor**

Example

| ERD | 25 | F | J | 102 |
|---|---|---|---|---|
| Type | Wattage | Shape | Tolerance | Value |

| ERX | 2 | AN | J | 471 |
|---|---|---|---|---|
| Type | Wattage | Shape | Tolerance | Value 47x10¹ (ohm) |

**Numbering System of Capacitor**

Example

| ECKD | 1H | 102 | Z | F |
|---|---|---|---|---|
| Type | Voltage | Value | Tolerance | Peculiarity |

| ECEA | 50 | M | 330 |
|---|---|---|---|
| Type | Voltage | Peculiarity | Value (33x10⁰ microfarad) |

| Resistor Type | | Wattage | Tolerance |
|---|---|---|---|
| ERD | : Carbon | 10 : 1/8W | J : ±5% |
| ERG | : Metal Oxide | 12 : 1/2W | F : ±1% |
| ERX | : Metal Film | 25 : 1/4W | G : ±2% |
| ERQ | : Fuse Type Metal | 1A : 1W | K : ±10% |
| ERD□□ L | : Carbon (chip) | 18 : 1/8W | |
| ERO□□ K | : Metal Film (chip) | S2 : 1/4W | |
| ERC | : Solid | S1 : 1/2W | |
| | | 2F : 1/4W | |
| | | 50 : 1/2W | |
| | | 2A : 2W | |

| Capacitor Type | | Voltage | Tolerance |
|---|---|---|---|
| ECE | : Electrolytic | 0J : 6.3V | C : ±0.25pF |
| ECCD | : Ceramic | 1A : 10V | J : ±5% |
| ECKD | : Ceramic | 1C : 16V | K : ±10% |
| ECQM | : Polyester | 1E : 25V | Z : +80% −20% |
| | | 1H : 50V | |
| ECQP | : Polyproylene | 1V : 35V | P : +100% −0% |
| | | 50 : 50V | |
| ECG | : Ceramic | 05 : 50V | M : ±20% |
| ECEA□□□N | : Non Polar Electrolytic | 2H : 500V | |
| | | 2A : 100V | D : ±0.5pF |
| QCU□ | : Ceramic (Chip Type) | 1 : 100V | G : ±2% |
| ECUX | : Ceramic (Chip Type) | KC : 400V AC | |
| ECF | : Semiconductor | KC : 125VAC (UL) | |
| | | 1J 63V | |
| EECW | : Liquid electrolyte double layer capcitor | | |

| Ref. No. | Part No. | Part Code |
|---|---|---|
| RESISTORS | | |
| R1 | ERDS2TJ104 | 001 152 2348 2 |
| R2 | ERDS2TJ273 | 001 152 2436 3 |
| R101 | ERDS2TJ272 | 001 152 2354 4 |
| R102 | ERDS2TJ104 | 001 152 2348 2 |
| R103 | ERDS2TJ822 | 001 152 2455 0 |
| R104 | ERDS2TJ182 | 001 152 2352 6 |
| R105 | ERDS2TJ564 | 001 152 2447 0 |
| R108 | ERDS2TJ333 | 001 152 2358 0 |
| R114 | ERDS2TJ101 | 001 152 2421 0 |
| R117 | ERDS2TJ471 | 001 152 2361 5 |
| R118 | ERDS2TJ271 | 001 152 2435 4 |
| R119 | ERDS2TJ122 | 001 152 2423 8 |
| R121 | ERDS2TJ392 | 001 152 2439 0 |
| R122, R123 | ERDS2TJ331 | 001 152 2356 2 |
| R201 | ERDS2TJ104 | 001 152 2348 2 |
| R202 | ERDS2TJ222 | 001 152 2353 5 |
| R203 | ERDS2TJ473 | 001 152 2363 3 |
| R204 | ERDS2TJ563 | 001 152 2446 1 |
| R205 | ERDS2TJ124 | 001 152 2425 6 |
| R206 | ERDS2TJ101 | 001 152 2421 0 |
| R207 | ERDS2TJ104 | 001 152 2348 2 |
| R208 | ERDS2TJ333 | 001 152 2358 0 |
| R209 | ERDS2TJ102 | 001 152 2346 4 |
| R210 | ERDS2TJ274 | 001 152 2437 2 |
| R211 | ERDS2TJ222 | 001 152 2353 5 |
| R212, R251 | ERDS2TJ473 | 001 152 2363 3 |
| R252, R253 | ERDS2TJ182 | 001 152 2352 6 |
| R254 | ERDS2TJ223 | 001 152 2432 7 |
| R256 | ERDS2TJ103 | 001 152 2347 3 |
| R301 | ERDS2TJ102 | 001 152 2346 4 |
| R302 | ERDS2TJ563 | 001 152 2446 1 |
| R303 | ERDS2TJ473 | 001 152 2363 3 |
| R304, R305 | ERDS2TJ564 | 001 152 2447 0 |
| R306, R307 | ERDS2TJ104 | 001 152 2348 2 |
| R309 | ERDS2TJ102 | 001 152 2346 4 |
| R310, R311 | ERDS2TJ274 | 001 152 2437 2 |
| R312 | ERDS2TJ274 | 001 152 2437 2 |
| R313 | ERDS2TJ103 | 001 152 2347 3 |
| R315 | ERDS2TJ393 | 001 152 2440 7 |
| R321, R322 | ERDS2TJ274 | 001 152 2437 2 |
| R323 | ERDS2TJ473 | 001 152 2363 3 |
| R324 | ERDS2TJ564 | 001 152 2447 0 |
| R336 | ERDS2TJ123 | 001 152 2424 7 |
| R401 | ERDS2TJ271 | 001 152 2435 4 |
| R402 | ERDS2TJ222 | 001 152 2353 5 |
| R403 | ERDS2TJ331 | 001 152 2356 2 |
| R404 | ERDS2TJ121 | 001 152 2349 1 |
| R405 | ERDS2TJ151 | 001 152 2426 5 |
| R406 | ERDS2TJ470 | 001 152 2442 5 |
| R407 | ERDS2TJ331 | 001 152 2356 2 |
| R408 | ERDS2TJ152 | 001 152 2350 8 |
| R410 | ERDS2TJ472 | 001 152 2362 4 |
| R501 | ERDS2TJ103 | 001 152 2347 3 |
| R505, R506 | ERDS2TJ155 | 001 152 2766 8 |
| R601 | ERDS2TJ332 | 001 152 2357 1 |
| R602 | ERDS2TJ561 | 001 152 2364 2 |
| R603 | ERDS2TJ331 | 001 152 2356 2 |
| R604 | ERDS2TJ332 | 001 152 2357 1 |
| R605 | ERDS2TJ101 | 001 152 2421 0 |
| R606 | ERDS2TJ102 | 001 152 2346 4 |
| R607, R608 | ERDS2TJ332 | 001 152 2357 1 |
| R609 | ERDS2TJ561 | 001 152 2364 2 |
| R610 | ERDS2TJ101 | 001 152 2421 0 |
| R610 | ERDS2TJ561 | 001 152 2364 2 |
| R611 | ERDS2TJ102 | 001 152 2346 4 |
| R612 | ERDS2TJ331 | 001 152 2356 2 |
| R613, R614 | ERDS2TJ332 | 001 152 2357 1 |
| R702 | ERDS2TJ152 | 001 152 2350 8 |
| R703 | ERDS2TJ222 | 001 152 2353 5 |
| R704, R705 | ERDS2TJ822 | 001 152 2455 0 |
| R710 | ERDS1FJ102 | 001 152 2614 3 |
| R724 | ERDS2TJ473 | 001 152 2363 3 |
| R725 | ERDS2TJ182 | 001 152 2352 6 |
| R904 | ERDS2TJ681 | 001 152 2449 8 |
| R905 | ERDS2TJ103 | 001 152 2347 3 |
| R907 | ERDS2TJ102 | 001 152 2346 4 |
| R908 | ERDS2TJ123 | 001 152 2424 7 |
| R913 | ERDS2TJ273 | 001 152 2436 3 |
| R915 | ERDS2TJ103 | 001 152 2347 3 |
| R916 | ERDS2TJ682 | 001 152 2365 1 |
| R918 | ERDS2TJ102 | 001 152 2346 4 |
| R923 | ERDS1FJ473 | |
| R926, R927 | ERDS2TJ472 | 001 152 2362 4 |
| R928, R929 | ERDS2TJ472 | 001 152 2362 4 |
| R930 | ERDS2TJ472 | 001 152 2362 4 |
| R951 | ERDS2TJ102 | 001 152 2346 4 |
| R952 | ERDS2TJ332 | 001 152 2357 1 |
| R953 | ERDS2TJ123 | 001 152 2424 7 |
| R954 | ERDS2TJ102 | 001 152 2346 4 |
| R955 | ERDS2TJ822 | 001 152 2455 0 |
| CAPACITORS | | |
| C1 | ECEA1EU3R3 | 001 120 2839 6 |
| C2 | ECKD1H103PF | 001 103 1449 7 |
| C5 | ECEA1CU470 | 001 120 2835 0 |
| C101 | ECQM1H223JZ | 001 106 0739 9 |
| C102 | ECEA1AU101 | 001 120 2830 5 |
| C103 | ECQM1H102JZ | 001 106 0661 4 |
| C104, C105 | ECKD1H103PF | 001 103 1449 7 |
| C106 | ECCD1H070CC | 001 103 0271 9 |
| C107 | RCBS1H101KBY | 001 103 5569 4 |
| C108 | ECEA1AU101 | 001 120 2830 5 |
| C109 | ECEA1HUR22 | 001 120 3247 0 |
| C110 | ECFTD104KXL | 001 108 0793 3 |
| C114 | ECKD1H103PF | 001 103 1449 7 |
| C116 | ECQM1H102JZ | 001 106 0661 4 |
| C118, C119 | ECKD1H103PF | 001 103 1449 7 |
| C120 | ECKD1H103PF | 001 103 1449 7 |
| C121 | ECFTD223KXL | 001 108 0342 6 |
| C122 | ECEA0JU471 | 001 120 2924 0 |
| C126 | ECKD1H103PF | 001 103 1449 7 |
| C130 | RCBS1H180JCY | 001 103 5591 6 |
| C202 ⚠ | ECKD1H223PF | 001 103 1510 9 |
| C203 | ECCD1H150KC | 001 103 0410 6 |
| C204 | ECQP1471JZ | 001 106 1107 1 |
| C205, C206 | ECKD1H103PF | 001 103 1449 7 |
| C207 | RCBS1H8R2KCY | 001 103 5644 0 |
| C208 | ECCD1H680K | 001 103 0682 4 |
| C209 | ECKD1H103PF | 001 103 1449 7 |
| C210 | ECEA0JU330 | 001 120 3162 4 |
| C211 | ECKD1H103PF | 001 103 1449 7 |
| C212 | ECEA1HUR47 | 001 120 3249 8 |
| C213 ⚠ | ECKD1H223PF | 001 103 1510 9 |
| C214 | ECFTD183KXL | 001 108 0358 8 |
| C215 | ECKD1H103PF | 001 103 1449 7 |
| C216 | ECEA0JU330 | 001 120 3162 4 |
| C251 | ECQP1391JZ | 001 106 1101 7 |



| Ref. No. | Part No. | Part Code |
|---|---|---|
| C301 | ECKD1H103PF | 001 103 1449 7 |
| C302 | ECQM1H102JZ | 001 106 0661 4 |
| C303 | ECEA1AU101 | 001 120 2830 5 |
| C305, C306 | ECQM1H153JZ | 001 106 0704 0 |
| C307, C308 | ECEA1EU3R3 | 001 120 2839 6 |
| C309, C310 | ECEA1CU100 | 001 120 2905 3 |
| C313 | ECEA1HUR47 | 001 120 3249 8 |
| C314, C315 | ECEA1HUR22 | 001 120 3247 0 |
| C316 | ECEA1CU100 | 001 120 2905 3 |
| C320, C321 | ECFTD223KXL | 001 108 0342 6 |
| C326 | ECQP1391JZ | 001 106 1101 7 |
| C401 | ECEA1CU100 | 001 120 2905 3 |
| C502 | ECEA1HUR22 | 001 120 3247 0 |
| C701 | ECEA16V1000 | 001 120 2545 7 |
| C702 | ECEA1CU222 | 001 120 3074 3 |
| C704 | ECEA1EU101 | 001 120 2837 8 |
| C705, C706 | ECKD1H103PF | 001 103 1449 7 |
| C707, C708 | ECKD1H103PF | 001 103 1449 7 |
| C717 | ECEA1CU100 | 001 120 2905 3 |
| C901 | ECKD1H103PF | 001 103 1449 7 |
| C902 | ECEA0JU222 | 001 120 3161 5 |
| C904 | ECEA0JU471 | 001 120 2924 0 |
| C905 | ECCD1H330KC | 001 103 0569 4 |
| C906 | ECCD1H060CC | 001 103 0264 8 |
| C907 | ECKD1H103PF | 001 103 1449 7 |
| C908 | ECQM1H223JZ | 001 106 0739 9 |
| C909 | ECKD1H103PF | 001 103 1449 7 |
| C910 | ECEA25M4R7R | 001 120 0838 5 |
| C912 | ECKD1H103PF | 001 103 1449 7 |
| C914 | ECEA1HU010 | 001 120 2842 1 |
| C951 ⚠ | ECKD1H223PF | 001 103 1510 9 |
| C952 | ECEA1HU010 | 001 120 2842 1 |
| C953 | ECQM1H223JZ | 001 106 0739 9 |
| C955 | ECEA1HUR47 | 001 120 3249 8 |

# ■ REPLACEMENT PARTS LIST

**Notes:** • Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
• Ⓚ-marked parts are used for black only, while Ⓢ-marked parts are for silver type only.
• Part other than Ⓚ-and Ⓢ-marked are use for both black and silver type.
• Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

| Ref. No. | Part No. | Part Code | Description |
|---|---|---|---|
| INTEGRATED CIRCUITS | | | |
| IC101 | AN7274NS | 001 060 8244 6 | I.C., FM IF/AM |
| IC102 | AN278 | 001 060 0102 1 | I.C., FM IF |
| IC301 | AN7472S | 001 060 8249 1 | I.C., FM MPX |
| IC303 | AN6554F | 001 060 2992 1 | I.C., AMP |
| IC901 | UPD17186514 | 001 061 1045 4 | I.C., PLL |
| TRANSISTORS | | | |
| Q201, Q251 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q252, Q253 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q255 | 2SA1175FE | 001 030 5075 5 | TRANSISTOR |
| Q401, Q402 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q403, Q404 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q701, Q702 | 2SD592ANCQ | 001 030 1752 7 | TRANSISTOR |
| Q703 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q704 | 2SK301 | 001 030 2428 2 | TRANSISTOR |
| Q705 | UN4214 | 001 030 4835 3 | TRANSISTOR |
| Q706, Q712 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q902, Q903 | 2SC1310-G | 001 030 6080 4 | TRANSISTOR |
| Q904 | 2SA1175FE | 001 030 5075 5 | TRANSISTOR |
| Q905 | UN4113 | 001 030 2900 9 | TRANSISTOR |
| Q906, Q951 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q952 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| DIODES | | | |
| D101 | MA165 | 001 032 0494 0 | DIODE |
| D201 | KV1260Z | 001 032 7237 7 | DIODE |
| D202, D203 | MA165 | 001 032 0494 0 | DIODE |
| D301, D302 | MA165 | 001 032 0494 0 | DIODE |
| D304 | MA165 | 001 032 0494 0 | DIODE |
| D305 | MA4082M | 001 032 4955 6 | DIODE |
| D402 | LN846RP | 001 032 3839 3 | L.E.D |
| D403, D404 | LN446YP | 001 032 3834 8 | L.E.D |
| D405 | LN846RP | 001 032 3839 3 | L.E.D |
| D701, D702 ⚠ | SVD1SR35200A | 001 032 3951 4 | RECTIFIER |
| D704 | MA4062-M | 001 032 7211 7 | DIODE |
| D710, D711 | MA165 | 001 032 0494 0 | DIODE |
| D901, D902 | MA162A | 001 032 0493 1 | DIODE |
| D906, D907 | MA165 | 001 032 0494 0 | DIODE |
| D908, D909 | MA165 | 001 032 0494 0 | DIODE |
| D911, D912 | MA165 | 001 032 0494 0 | DIODE |
| D926, D931 | MA165 | 001 032 0494 0 | DIODE |
| D932 | MA4091-M | 001 032 7213 5 | DIODE |
| D933 | MA165 | 001 032 0494 0 | DIODE |
| VARIABLE RESISTORS | | | |
| VR301 | QVNB3A00B104 | 001 180 1594 6 | VARIABLE RESISTOR |
| VR302 | QVNB3A00B103 | 001 180 1684 5 | VARIABLE RESISTOR |
| VARIABLE CAPACITORS | | | |
| CT201 | SVCTZ03T110F | 001 142 0370 8 | VARIABLE CAPACITOR |
| CT251 | SVCTZ03R200F | 001 142 0369 1 | TRIMMER |

| Ref. No. | Part No. | Part Code | Description |
|---|---|---|---|
| THERMISTORS AND VARISTORS | | | |
| TH102 | ERTD2ZHL332S | 001 191 0186 1 | THERMISTOR |
| COILS AND TRANSFORMERS | | | |
| L101 | ELEPK101KA | 001 211 0855 8 | CHOKE COIL |
| L202 | SLA2B3-P | 001 211 2249 6 | ANTENNA COIL |
| L203 | SL02B9R-P | 001 211 2783 9 | OSCILLATOR COIL |
| L204 | SLQB20G-1P | 001 211 2711 5 | CHOCK COIL |
| L251 | SLA1B7R-P | 001 211 2779 5 | ANTENNA COIL |
| L252 | SL01B5-P | 001 211 2782 0 | OSCILLATOR COIL |
| L901, L902 | RLQY25S5-0 | 001 210 1383 0 | CHOKE COIL |
| T101 | SLI4B520-Z | 001 211 0628 7 | I.F. TRANSFORMER |
| T102 | SLI4B521-Z | 001 211 0629 6 | I.F. TRANSFORMER |
| T201 | SLI2B104-M | 001 215 2837 2 | I.F. TRANSFORMER |
| T701 ⚠ (EX, EF, EB) | SLT5K171 | 001 202 8001 5 | POWER TRANSFORMER |
| T701 ⚠ (EK) | SLT5K175 | 001 202 8002 4 | POWER TRANSFORMER |
| FILTERS | | | |
| CF101 | SVFE107MZ2-Q | 001 241 | CERAMIC FILTER |
| CF102 | SVFE107MX2-Q | 001 241 1128 0 | CERAMIC FILTER |
| CF201 | SVFSFZ450F7L | 001 241 0429 4 | CERAMIC FILTER |
| OSCILLATORS | | | |
| X901 | SVQ43U452-D | 001 250 1506 3 | CRYSTAL OSC |
| DISPLAYS | | | |
| LCD | SALHLC9225-4 | 001 080 0277 7 | LIQUID CRYSTAL DISPLAY |
| FRONT PACKS | | | |
| FE | SNVFE306E15 | 001 141 0539 6 | FRONT END PACK |
| LAMPS | | | |
| PL1 | XAMS15S150 | 002 351 0974 3 | LAMP |
| FUSES | | | |
| F1 ⚠ (EK) | XBA2C05TB0 | 002 380 1350 2 | FUSE, T0.5A 250V |
| F1 ⚠ (EX, EF, EB) | XBA2C05TR0 | 002 380 0395 3 | FUSE, T0.5A 250V |
| SWITCHES | | | |
| S1, S2 | SSG13 | 003 435 2951 9 | SW, CH1-CH2 |
| S3, S4 | SSG13 | 003 435 2951 9 | SW, CH3-CH4 |
| S5, S6 | SSG13 | 003 435 2951 9 | SW, CH5-CH6 |
| S7, S8 | SSG13 | 003 435 2951 9 | SW, CH7-CH8 |
| S9, S10 | SSG13 | 003 435 2951 9 | SW, UP-DOWN |
| S11, S12 | SSG13 | 003 435 2951 9 | SW, MEMO.MODE |
| S13, S14 | SSG13 | 003 435 2951 9 | SW, MW-LW |
| S15 | SSG13 | 003 435 2951 9 | SW, FM |
| S701 ⚠ | SSH1214 | 003 435 5649 0 | SW, POWER |

| Ref. No. | P |
|---|---|
| CABINET AND CHASSIS | |
| 1 Ⓚ | SGW |
| 1 Ⓢ | SGW |
| 1-1 Ⓢ | SGU |
| 1-1 Ⓚ | SGU |
| 2 | SUW |
| 3 Ⓢ | SBC |
| 3 Ⓚ | SBC |
| 4 Ⓚ | SBC |
| 4 Ⓢ | SBC |
| 5 Ⓢ | SBC |
| 5 Ⓚ | SBC |
| 6 Ⓚ | SGX |
| 6 Ⓢ | SGX |
| 7 Ⓚ | SGX |
| 7 Ⓢ | SGX |
| 8 | SUW |
| 9 Ⓢ | SBC |
| 9 Ⓚ | SBC |
| 10 Ⓚ | SKC |
| 10 Ⓢ | SKC |
| 11 | SHR |
| 12 | SDU |
| 13 | SMP |
| 14 | SHR |
| 15 | SJT |
| 16 | SHG |
| 17 ⚠ | SJS |
| 18 | SJF |
| 19 | SUS |
| 20 | SHE |
| 21 | SHE |
| 22 | SGP |
| 22 | SNE |
| 23 | SKL |

■ TERM

| | Tolerance |
|---|---|
| | J : ±5%<br>F : ±1%<br>G : ±2%<br>K : ±10% |

| | Tolerance |
|---|---|
| | C : ±0.25pF<br>J : ±5%<br>K : ±10%<br>Z : +80%<br>−20%<br>P : +100%<br>−0%<br>M : ±20%<br><br>D : ±0.5pF<br>G : ±2% |

| o. | Part Code |
|---|---|
| 2 | 001 152 2362 4 |
| 2 | 001 152 2346 4 |
| 2 | 001 152 2357 1 |
| 3 | 001 152 2424 7 |
| 2 | 001 152 2346 4 |
| 2 | 001 152 2455 0 |
| | |
| 3 | 001 120 2839 6 |
| PF | 001 103 1449 7 |
| 0 | 001 120 2835 0 |
| UZ | 001 106 0739 9 |
| 1 | 001 120 2830 5 |
| UZ | 001 106 0661 4 |
| PF | 001 103 1449 7 |
| CC | 001 103 0271 9 |
| KBY | 001 103 5569 4 |
| 1 | 001 120 2830 5 |
| 2 | 001 120 3247 0 |
| KL | 001 108 0793 3 |
| PF | 001 103 1449 7 |
| UZ | 001 106 0661 4 |
| PF | 001 103 1449 7 |
| PF | 001 103 1449 7 |
| KL | 001 108 0342 6 |
| | 001 120 2924 0 |
| PF | 001 103 1449 7 |
| ICY | 001 103 5591 6 |
| PF | 001 103 1510 9 |
| LC | 001 103 0410 6 |
| Z | 001 106 1107 1 |
| PF | 001 103 1449 7 |
| ICY | 001 103 5644 0 |
| | 001 103 0682 4 |
| F | 001 103 1449 7 |
| | 001 120 3162 4 |
| F | 001 103 1449 7 |
| Y | 001 120 3249 8 |
| F | 001 103 1510 9 |
| L | 001 108 0358 8 |
| F | 001 103 1449 7 |
| | 001 120 3162 4 |
| | 001 106 1101 7 |

| Ref. No. | Part No. | Part Code | Ref. No. | Part No. | Part Code | Ref. No. | Part No. | Part Code |
|---|---|---|---|---|---|---|---|---|
| C301 | ECKD1H103PF | 001 103 1449 7 | C401 | ECEA1CU100 | 001 120 2905 3 | C905 | ECCD1H330KC | 001 103 0569 4 |
| C302 | ECQM1H102JZ | 001 106 0661 4 | C502 | ECEA1HUR22 | 001 120 3247 0 | C906 | ECCD1H060CC | 001 103 0264 8 |
| C303 | ECEA1AU101 | 001 120 2830 5 | C701 | ECEA16V1000 | 001 120 2545 7 | C907 | ECKD1H103PF | 001 103 1449 7 |
| C305, C306 | ECQM1H153JZ | 001 106 0704 0 | C702 | ECEA1CU222 | 001 120 3074 3 | C908 | ECQM1H223JZ | 001 106 0739 9 |
| C307, C308 | ECEA1EU3R3 | 001 120 2839 6 | C704 | ECEA1EU101 | 001 120 2837 8 | C909 | ECKD1H103PF | 001 103 1449 7 |
| C309, C310 | ECEA1CU100 | 001 120 2905 3 | C705, C706 | ECKD1H103PF | 001 103 1449 7 | C910 | ECEA25M4R7R | 001 120 0838 5 |
| C313 | ECEA1HUR47 | 001 120 3249 8 | C707, C708 | ECKD1H103PF | 001 103 1449 7 | C912 | ECKD1H103PF | 001 103 1449 7 |
| C314, C315 | ECEA1HUR22 | 001 120 3247 0 | C717 | ECEA1CU100 | 001 120 2905 3 | C914 | ECEA1HU010 | 001 120 2842 1 |
| C316 | ECEA1CU100 | 001 120 2905 3 | C901 | ECKD1H103PF | 001 103 1449 7 | C951 ⚠ | ECKD1H223PF | 001 103 1510 9 |
| C320, C321 | ECFTD223KXL | 001 108 0342 6 | C902 | ECEA0JU222 | 001 120 3161 5 | C952 | ECEA1HU010 | 001 120 2842 1 |
| C326 | ECQP1391JZ | 001 106 1101 7 | C904 | ECEA0JU471 | 001 120 2924 0 | C953 | ECQM1H223JZ | 001 106 0739 9 |
| | | | | | | C955 | ECEA1HUR47 | 001 120 3249 8 |

# ■ REPLACEMENT PARTS LIST

**Notes:** • Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
• Ⓚ-marked parts are used for black only, while Ⓢ-marked parts are for silver type only.
• Part other than Ⓚ-and Ⓢ-marked are use for both black and silver type.
• Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

| Ref. No. | Part No. | Part Code | Description |
|---|---|---|---|
| INTEGRATED CIRCUITS | | | |
| IC101 | AN7274NS | 001 060 8244 6 | I.C., FM I.F/AM |
| IC102 | AN278 | 001 060 0102 1 | I.C., FM I.F |
| IC301 | AN7472S | 001 060 8249 1 | I.C., FM MPX |
| IC303 | AN6554F | 001 060 2992 1 | I.C., AMP |
| IC901 | UPD1718G514 | 001 061 1045 4 | I.C., PLL |
| TRANSISTORS | | | |
| Q201, Q251 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q252, Q253 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q255 | 2SA1175FE | 001 030 5075 5 | TRANSISTOR |
| Q401, Q402 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q403, Q404 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q701, Q702 | 2SD592ANCQ | 001 030 1752 7 | TRANSISTOR |
| Q703 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q704 | 2SK301 | 001 030 2428 2 | TRANSISTOR |
| Q705 | UN4214 | 001 030 4835 3 | TRANSISTOR |
| Q706, Q712 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q902, Q903 | 2SC1310-G | 001 030 6080 4 | TRANSISTOR |
| Q904 | 2SA1175FE | 001 030 5075 5 | TRANSISTOR |
| Q905 | UN4113 | 001 030 2900 9 | TRANSISTOR |
| Q906, Q951 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| Q952 | 2SC3311A-Q | 001 030 5279 5 | TRANSISTOR |
| DIODES | | | |
| D101 | MA165 | 001 032 0494 0 | DIODE |
| D201 | KV1260Z | 001 032 7237 7 | DIODE |
| D202, D203 | MA165 | 001 032 0494 0 | DIODE |
| D301, D302 | MA165 | 001 032 0494 0 | DIODE |
| D304 | MA165 | 001 032 0494 0 | DIODE |
| D305 | MA4082M | 001 032 4955 6 | DIODE |
| D402 | LN846RP | 001 032 3839 3 | L.E.D |
| D403, D404 | LN446YP | 001 032 3834 8 | L.E.D |
| D405 | LN846RP | 001 032 3839 3 | L.E.D |
| D701, D702 ⚠ | SVD1SR35200A | 001 032 3951 4 | RECTIFIER |
| D704 | MA4062-M | 001 032 7211 7 | DIODE |
| D710, D711 | MA165 | 001 032 0494 0 | DIODE |
| D901, D902 | MA162A | 001 032 0493 1 | DIODE |
| D906, D907 | MA165 | 001 032 0494 0 | DIODE |
| D908, D909 | MA165 | 001 032 0494 0 | DIODE |
| D911, D912 | MA165 | 001 032 0494 0 | DIODE |
| D926, D931 | MA165 | 001 032 0494 0 | DIODE |
| D932 | MA4091-M | 001 032 7213 5 | DIODE |
| D933 | MA165 | 001 032 0494 0 | DIODE |
| VARIABLE RESISTORS | | | |
| VR301 | QVNB3A00B104 | 001 180 1594 6 | VARIABLE RESISTOR |
| VR302 | QVNB3A00B103 | 001 180 1684 5 | VARIABLE RESISTOR |
| VARIABLE CAPACITORS | | | |
| CT201 | SVCTZ03T110F | 001 142 0370 8 | VARIABLE CAPACITOR |
| CT251 | SVCTZ03R200F | 001 142 0369 1 | TRIMMER |

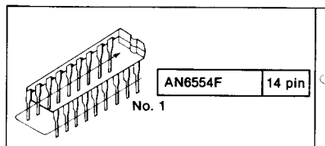
| Ref. No. | Part No. | Part Code | Description |
|---|---|---|---|
| THERMISTORS AND VARISTORS | | | |
| TH102 | ERTD2ZHL332S | 001 191 0186 1 | THERMISTOR |
| COILS AND TRANSFORMERS | | | |
| L101 | ELEPK101KA | 001 211 0855 8 | CHOKE COIL |
| L202 | SLA2B3-P | 001 211 2249 6 | ANTENNA COIL |
| L203 | SL02B9R-P | 001 211 2783 9 | OSCILLATOR COIL |
| L204 | SLQB20G-1P | 001 211 2711 5 | CHOCK COIL |
| L251 | SLA1B7R-P | 001 211 2779 5 | ANTENNA COIL |
| L252 | SL01B5-P | 001 211 2782 0 | OSCILLATOR COIL |
| L901, L902 | RLQY25S5-0 | 001 210 1383 0 | CHOKE COIL |
| T101 | SLI4B520-Z | 001 211 0628 7 | I.F. TRANSFORMER |
| T102 | SLI4B521-Z | 001 211 0629 6 | I.F. TRANSFORMER |
| T201 | SLI2B104-M | 001 215 2837 2 | I.F. TRANSFORMER |
| T701 ⚠ (EX, EF, EB) | SLT5K171 | 001 202 8001 5 | POWER TRANSFORMER |
| T701 ⚠ (EK) | SLT5K175 | 001 202 8002 4 | POWER TRANSFORMER |
| FILTERS | | | |
| CF101 | SVFE107MZ2-Q | 001 241 | CERAMIC FILTER |
| CF102 | SVFE107MX2-Q | 001 241 1128 0 | CERAMIC FILTER |
| CF201 | SVFSFZ450F7L | 001 241 0429 4 | CERAMIC FILTER |
| OSCILLATORS | | | |
| X901 | SVQ43U452-D | 001 250 1506 3 | CRYSTAL OSC |
| DISPLAYS | | | |
| LCD | SALHLC9225-4 | 001 080 0277 7 | LIQUID CRYSTAL DISPLAY |
| FRONT PACKS | | | |
| FE | SNVFE306E15 | 001 141 0539 6 | FRONT END PACK |
| LAMPS | | | |
| PI1 | XAMS15S150 | 002 351 0974 3 | LAMP |
| FUSES | | | |
| F1 ⚠ (EK) | XBA2C05TB0 | 002 380 1350 2 | FUSE, T0.5A 250V |
| F1 ⚠ (EX, EF, EB) | XBA2C05TR0 | 002 380 0395 3 | FUSE, T0.5A 250V |
| SWITCHES | | | |
| S1, S2 | SSG13 | 003 435 2951 9 | SW, CH1-CH2 |
| S3, S4 | SSG13 | 003 435 2951 9 | SW, CH3-CH4 |
| S5, S6 | SSG13 | 003 435 2951 9 | SW, CH5-CH6 |
| S7, S8 | SSG13 | 003 435 2951 9 | SW, CH7-CH8 |
| S9, S10 | SSG13 | 003 435 2951 9 | SW, UP-DOWN |
| S11, S12 | SSG13 | 003 435 2951 9 | SW, MEMO MODE |
| S13, S14 | SSG13 | 003 435 2951 9 | SW, MW-LW |
| S15 | SSG13 | 003 435 2951 9 | SW, FM |
| S701 ⚠ | SSH1214 | 003 435 5649 0 | SW., POWER |



| Ref. No. | Part No. | Part Code | Description |
|---|---|---|---|
| CABINET AND CHASSIS | | | |
| 1 Ⓚ | SGWTG45AL-KE | 016 840 7883 2 | FRONT PANEL (K) |
| 1 Ⓢ | SGWTG45AL-SE | 016 840 8002 9 | FRONT PANEL (S) |
| 1-1 Ⓢ | SGU497-6 | 016 842 1678 9 | FILTER |
| 1-1 Ⓚ | SGU497-7 | 016 842 1717 9 | FILTER |
| 2 | SUW3011 | 016 650 5196 4 | BRACKET |
| 3 Ⓢ | SBC817-1A | 016 702 6498 2 | BUTTON, PRESET |
| 3 Ⓚ | SBC817A | 016 702 6499 1 | BUTTON, PRESET |
| 4 Ⓚ | SBC810-4 | 016 702 6496 4 | BUTTON, FUNCTION |
| 4 Ⓢ | SBC810-5 | 016 702 6497 3 | BUTTON, FUNCTION |
| 5 Ⓢ | SBC812-1A | 016 702 6452 6 | BUTTON, BAND |
| 5 Ⓚ | SBC812A | 016 702 6455 3 | BUTTON, BAND |
| 6 Ⓚ | SGX7733 | 016 846 2908 0 | ORNAMENT |
| 6 Ⓢ | SGX7733-1 | 016 846 2497 8 | ORNAMENT |
| 7 Ⓚ | SGX7830-2 | 016 846 3228 3 | ORNAMENT |
| 7 Ⓢ | SGX7830-3 | 016 846 3284 5 | ORNAMENT |
| 8 | SUW3002 | 016 650 5184 8 | BRACKET |
| 9 Ⓢ | SBC666 | 016 702 5545 6 | BUTTON, POWER, POWER |
| 9 Ⓚ | SBC666-5 | 016 702 6679 9 | BUTTON, POWER |
| 10 Ⓚ | SKC1710K99 | 016 800 2120 2 | CABINET |
| 10 Ⓢ | SKC1710S98 | 016 800 2121 1 | CABINET |
| 11 | SHR9796 | 016 652 0607 6 | PLASTIC SPACER |
| 12 | SDU249-1 | 016 842 0850 9 | GALSS TRANSPARENT PLATE |
| 13 | SMP408 | 016 632 1788 4 | ANGLE |
| 14 | SHR415 | 016 652 0088 7 | LOCK PIN |
| 15 | SJT347 | 003 410 1830 8 | FUSE HOLDER |
| 16 | SHG1639 | 016 653 0657 1 | RUBBER PARTS |
| 17 ⚠ | SJS9236 | 003 403 4660 7 | AC SOCKET |
| 18 | SJF8615N | 003 410 7262 4 | TERMINAL BOARD |
| 19 | SUS803 | 016 726 0633 5 | COIL SPRING |
| 20 | SHE181 | 016 918 0332 7 | SPACER |
| 21 | SHE185 | 016 918 0330 9 | SPACER |
| 22 | SGP6373A | 016 840 6547 9 | REAR PANEL |
| 22 | SNE55 | 003 410 1905 6 | CONNECTOR |
| 23 | SKL304 | 016 828 0315 9 | LEG,CASTER |

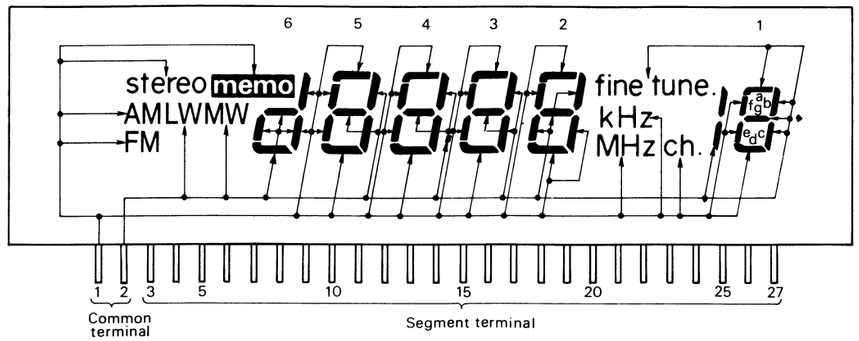
| Ref. No. | Part No. | Part Code | Description |
|---|---|---|---|
| 24 | XTB3+6FFZ | 005 501 1590 3 | SCREW |
| 25 | XTB3+12JFZ | 005 501 2078 0 | TAPPING SCREW |
| 26 | XTB3+10G | 005 501 2647 9 | SCREW |
| 27 Ⓢ | SNE2129 | 005 500 8058 5 | SCREW |
| 27 Ⓚ | SNE2129-1 | 005 500 7938 6 | SCREW |
| 28 | XTBS3+16F1 | 005 501 2606 8 | TAPPING SCREW |
| 29 | XTBS3+8JFZ1 | 005 501 2523 0 | SCREW |
| 30 | XTW3+8TFR | 005 501 2602 2 | SCREW |
| 31 | XTW3+8T | 005 501 1358 9 | SCREW |
| 32 | SJT30640LX-V | 003 410 6149 8 | CONNECTOR |
| 33 | SJT30940LX-V | 003 410 6150 5 | LUG TERMINAL |
| PACKINGS | | | |
| P1 (EX, EK, EB) | SPG5947 | 016 971 5104 6 | CARTON BOX |
| P1 (EF) | SPG5948 | 016 971 5145 7 | CARTON BOX |
| P2 | SPS4550-7 | 016 977 3097 6 | PAD |
| P3 | SPS4551-4 | 016 977 2905 3 | PAD |
| P4 | SPS4552 | 016 977 1354 6 | PAD |
| P5 Ⓢ | SPP697 | 016 978 0194 3 | PROTECTION COVER |
| P5 Ⓚ | SPP725 | 016 978 0208 4 | POLYETHYLENE SHEET |
| P6 | XZB24X40C04 | 016 978 0232 4 | POLYETHYLENE COVER |
| ACCESSORIES | | | |
| A1 ⚠ (EX, EF, EB) | SFDAC05E03 | 003 490 4809 5 | POWER CORD |
| A1 ⚠ (EK) | SFDAC05G02 | 003 490 2613 3 | POWER CORD |
| A2 | SJP2249-1 | 003 492 6446 4 | OUTPUT CORD |
| A3 (EK) | SJP9009 | 003 492 5594 7 | PLUG |
| A4 | SSA270M | 002 390 1568 0 | FM ANTENNA CORD |
| A5 | SPB1152T | 016 918 0624 8 | ANTTENA |
| A6 | SQF12889-2 | 016 983 5263 6 | INSTRUCTION BOOK |

# ■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

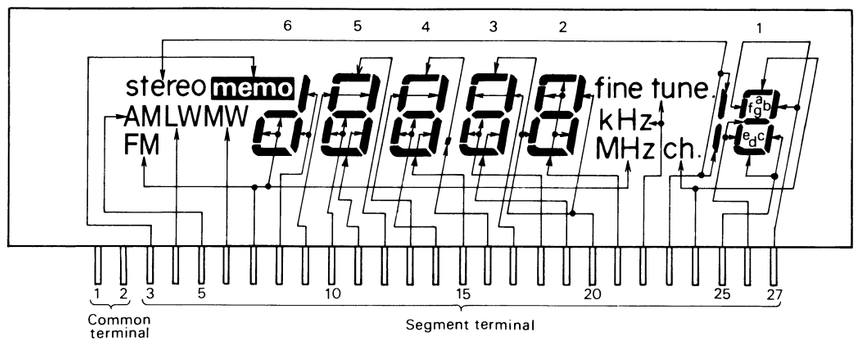


## ■ DESCRIPTION OF LCD PANEL

• **COMMON**




• **SEGMENT**

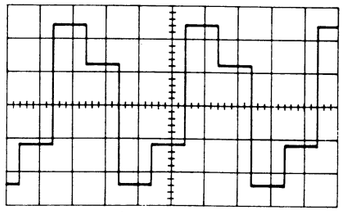



| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COM1 | COM1 | — | MEMO | — | AM | — | FM, MHz | 6b | 5f | 5e | 5d | 5a | 4f | 4e | 4d |
| COM2 | — | COM2 | — | LW | — | MW | 6deg | 6c | 5b | 5g | 5c | — | 4b | 4g | 4c |

| No. | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COM1 | 4a | 3f | 3e | 3d | 3a | 2acdf | kHz | stereo | ch | 1d | 1e | 1f |
| COM2 | ▰ | 3b | 3g | 3c | 2bc | 2g | fine tune | ▰ | 1a | 1c | 1g | 1b |

**< Segment ON >**

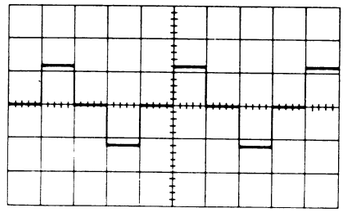
Pin ① or ② of LCD and each segment terminal.



2V AC/DIV, 5m sec/cm

**< Segment OFF >**

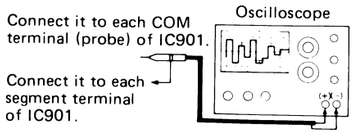
Pin ① or ② of LCD and each segment terminal.



2V AC/DIV, 5m sec/cm

• **Each segment waveform measuring method**

**Note:** Potential difference from COM terminal waveform is measured for each segment output waveform. So, do not connect the earth to other equipment on the oscilloscope side.
If the earth is connected, IC901 will break down.






## ■ SCHEMATIC DIAGRAM

**Note 1:**

- **S1~S8** : Preset tuning switch.
  [ S1—CH1/9, S2—CH2/10, S3—CH3/11, S4—CH4/12
  S5—CH5/13, S6—CH6/14, S7—CH7/15, S8—CH8/16 ]
- **S9, S10** : Tuning switch.
  [ S9 —down (tuning to lower frequency.)
  S10—up (tuning to higher frequency.) ]
- **S11** : Memory switch.
  memory ↔ auto memory
- **S12** : FM mode selector.
  auto ↔ mono
- **S13~S15** : Band selector.
  (ST-G45AL only) (S13—MW, S14—LW, S15—FM)
- **S16, S17** : Band selector.
  (ST-G45A only) (S16—AM, S17—FM)
- **S701** : Power switch in "on" position. (power)
- **S702** : Voltage selector.
  (ST-G45A [XA] [PA] [PE] areas only)

• Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
All voltage values shown in circuitry are DC voltage in FM signal (no signal) reception modes.
* Figures in ( ) stand for DC voltage in AM (MW) signal reception mode.
* Figures in (( )) stand for DC voltage in LW signal reception mode.
* Figures in ▭ stand for muting mode.

• ——— Positive voltage lines. ▒▒▒ AF signal.
⇨ FM signal ▫▫▫▷ FM OSC
➡ AM signal ▪▪▪▶ FM OSC

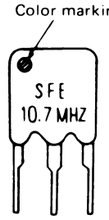
• Important safety notice.
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

| Part No. | Original Part No. | Supplyment Part No. |
|---|---|---|
| D901, D902 | MA150 | MA162A |

**Note 2:**

**• Use of ceramic filters in pairs**

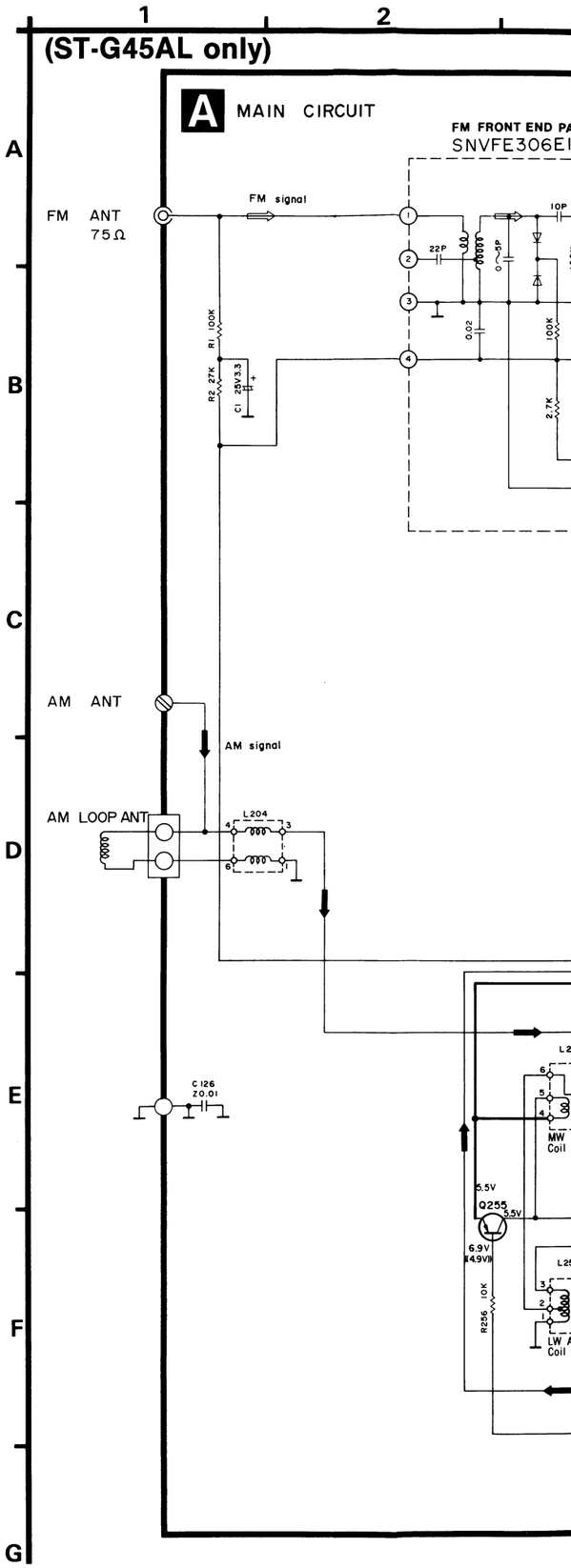
The ceramic filters (CF101, CF102) for FM-IF circuit are available in two ranks.
For this machine, be sure to use the ceramics of the same rank in a pair.
At repairing and replacement, pay close attention to the diode (D901, D902) for use as different diode must be used depending on each rank of the ceramic filters.




| RANK (Color) | D901 | D902 |
|---|---|---|
| Black | ○ | × |
| White | × | ○ |
| Red | × | × |

**Note:** ○ mark: Diode is used.
× mark: Diode is not used.





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  (ST-G45A [XA] [PA] [PE] areas only)

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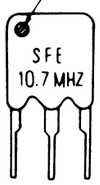
Color marking




| RANK (Color) | D901 | D902 |
|---|---|---|
| Black | ○ | × |
| White | × | ○ |
| Red | × | × |

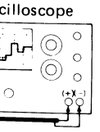
**Note:** ○ mark: Diode is used.
× mark: Diode is not used.



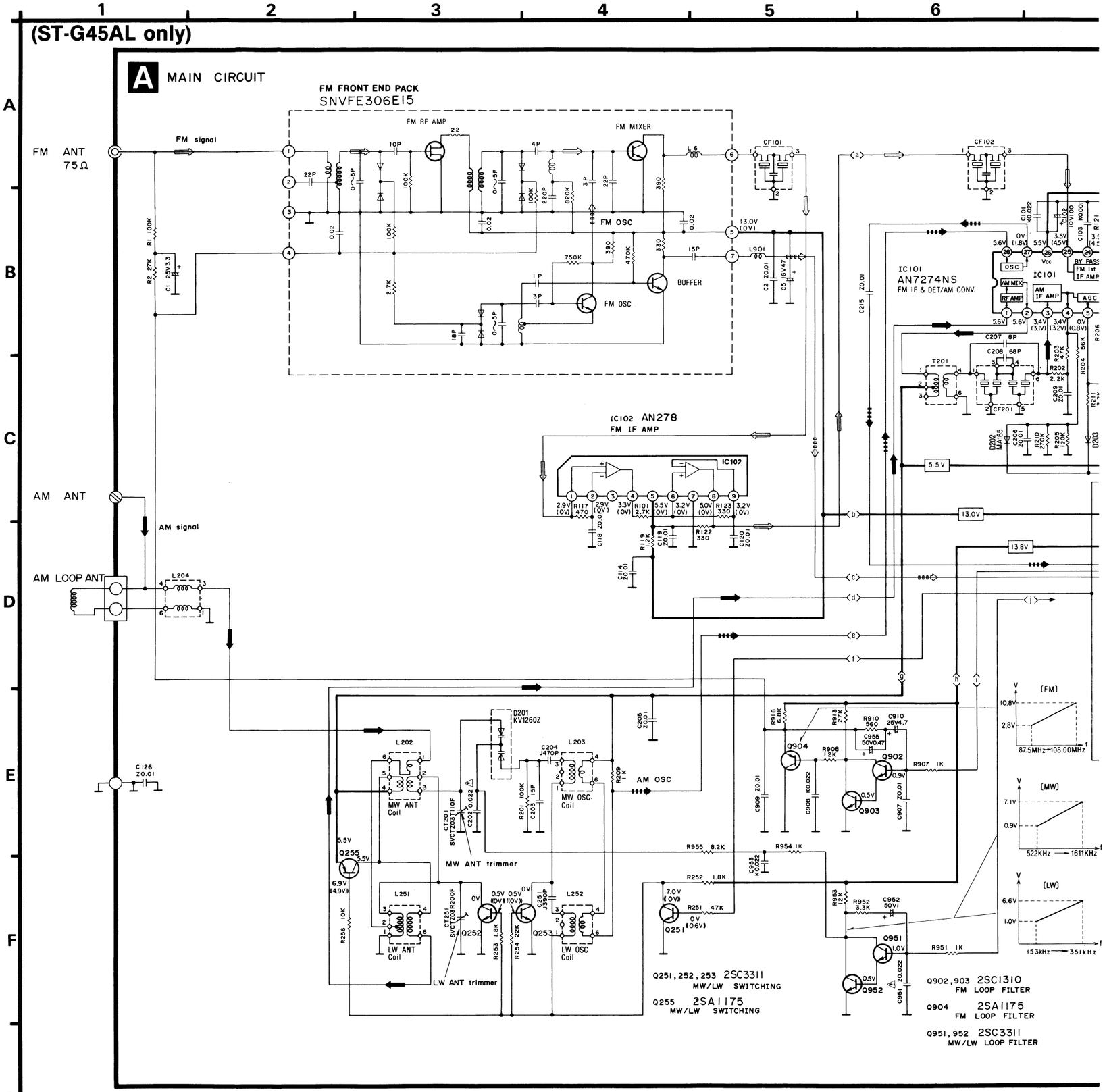
| | | |
|---|---|---|
| | 14 | 15 |
| | 4e | 4d |
| | 4g | 4c |

ent terminal.

cilloscope



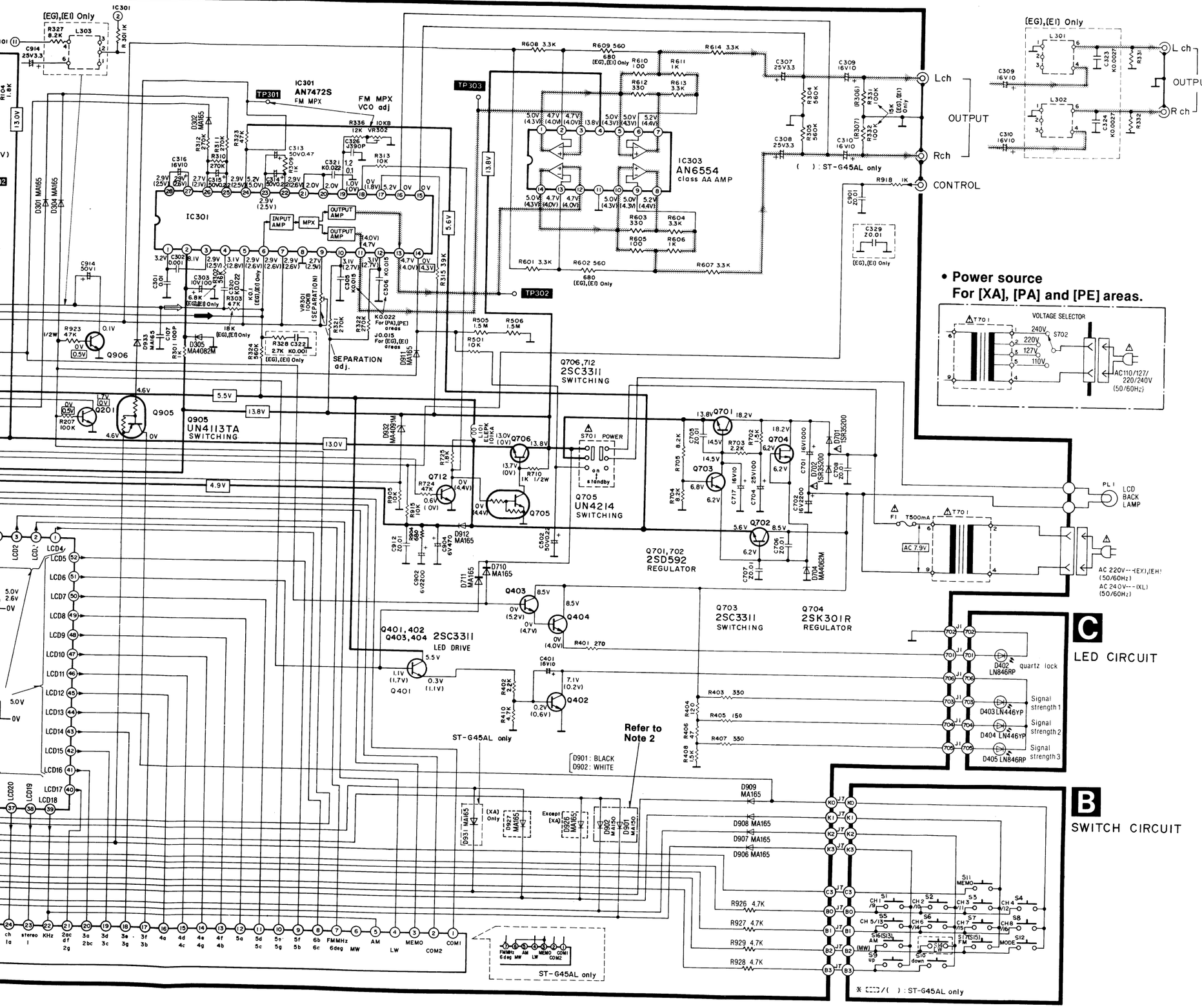
(ST-G45AL only)

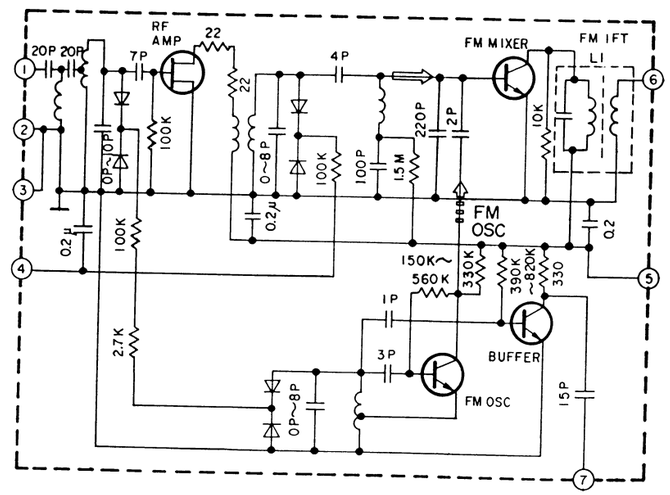


# A MAIN CIRCUIT

FM FRONT END PACK
SNVFE306E15 SNVFE306G25 (EG),(EI) Only

FM ANT 75Ω
AM ANT
AM LOOP ANT
FM signal
AM signal
FM ANT
(EG),(EI) Only
FM RF AMP
FM MIXER
FM OSC
BUFFER
IC102 AN278
FM IF AMP
IC101
AN7274NS
FM IF & DET/AM CONV.
FM DET coil
FM offset voltage (0mV)
AM (MW) RF adj.
Q201,906
2SC3311
SWITCHING
Q905
UN4113TA
SWITCHING
IC301
IC901
SVI μPD1718G514
PLL CONTROLLER
FM/MW/LW "Auto SCAN" mode
Common signal
Forcible monaural mode
Key scan/return signal
Muting output
Segment signal
LCD
MW ANT Coil
MW OSC Coil
AM OSC
AM ANT trimmer
Q202
2SA1309
Q904
2SA1309
FM LOOP FILTER
Q902,903
2SC1310
FM LOOP FILTER


IC301
AN7472S
FM MPX
FM MPX VCO adj
TP301
TP303
TP302
IC303
AN6554
class AA AMP
( ) : ST-G45AL only
Lch
Rch
OUTPUT
CONTROL
SEPARATION adj.
Q706,712
2SC3311
SWITCHING
Q905
UN4113TA
SWITCHING
Q705
UN4214
SWITCHING
Q701,702
2SD592
REGULATOR
Q703
2SC3311
SWITCHING
Q704
2SK301R
REGULATOR
Q401,402
Q403,404
2SC3311
LED DRIVE
Refer to Note 2
D901 : BLACK
D902 : WHITE
ST-G45AL only
S701 POWER
on
standby
PL1
LCD BACK LAMP
AC 220V--(EX),(EH)
(50/60Hz)
AC 240V--(XL)
(50/60Hz)
VOLTAGE SELECTOR
240V
220V
127V
110V
S702
AC110/127/220/240V
(50/60Hz)
• Power source
For [XA], [PA] and [PE] areas.
(EG),(EI) Only
L ch
R ch
OUTPUT
C
LED CIRCUIT
B
SWITCH CIRCUIT
quartz lock
Signal strength 1
Signal strength 2
Signal strength 3
* [ ]/( ) : ST-G45AL only


• [EG, Ei] only FM FRONT END PACK SNVFE306G25
RF AMP
FM MIXER
FM IFT
FM OSC
BUFFER
FM OSC

# ■ REPLACEMENT PARTS LIST

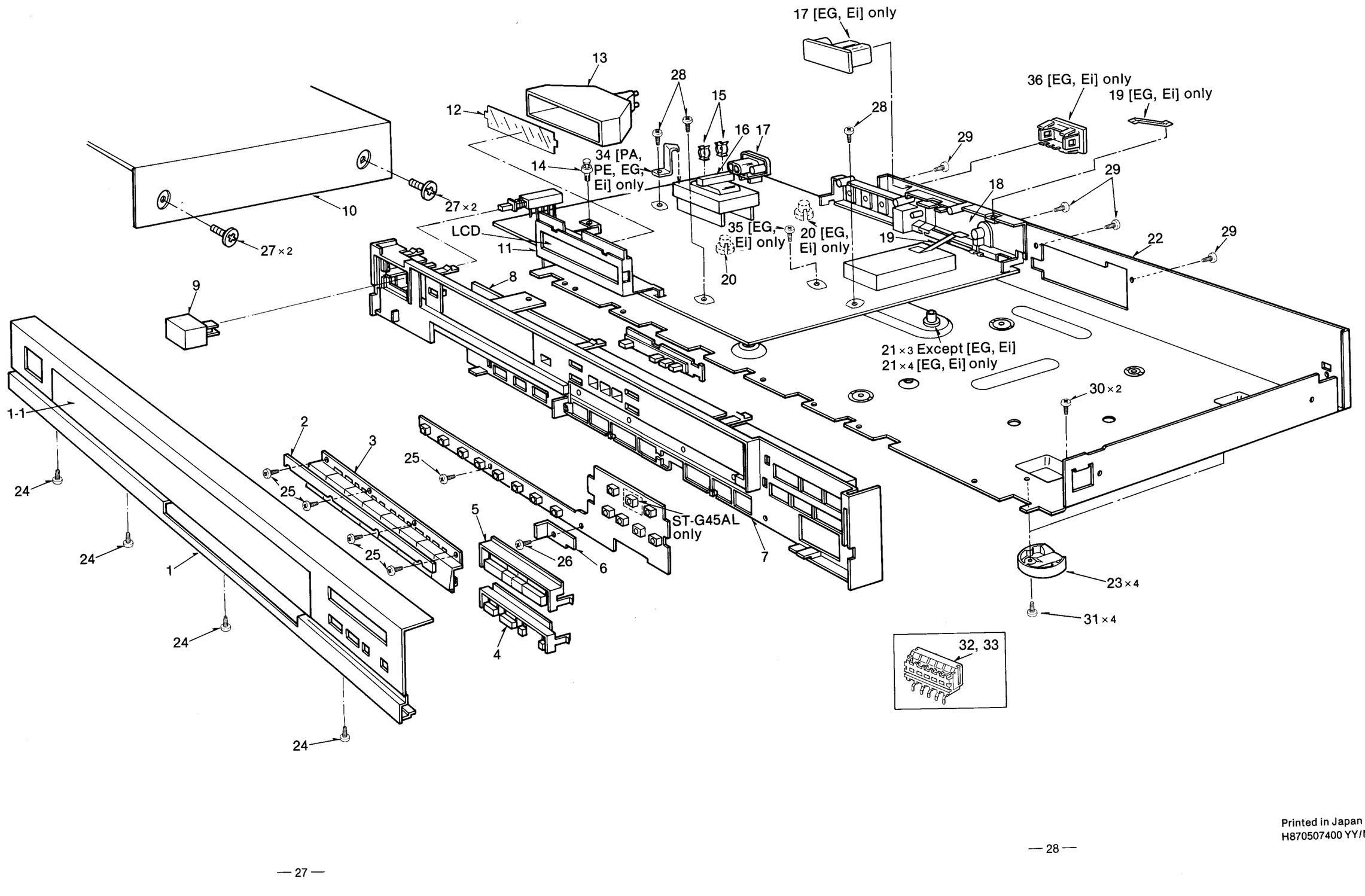
**• Change of Parts List (ST-G45A from ST-G45AL)**

| Ref. No. | Change of Part No. | | Part Name & Description | Pcs Set | Remarks |
|---|---|---|---|---|---|
| | ST-G45AL [EK] → | **ST-G45A [EX, EH, XL, XA, PA, PE, EG, Ei]** | | | |
| RESISTORS | | | | | |
| R208 | ERDS2TJ333 | **ERDS2TJ273** | 27kΩ [EG, Ei] only | 1 | |
| R213 | —— | **ERDS2TJ123** | 12kΩ | 1 | Addition |
| R251 | ERDS2TJ473 | —— | —— | — | Deletion |
| R252, 253 | ERDS2TJ182 | —— | —— | — | Deletion |
| R254 | ERDS2TJ223 | —— | —— | — | Deletion |
| R256 | ERDS2TJ103 | —— | —— | — | Deletion |
| R302 | ERDS2TJ563 | **ERDS2TJ682** | 6.8kΩ [EG, Ei] only | 1 | |
| R303 | ERDS2TJ473 | **ERDS2TJ183** | 18kΩ [EG, Ei] only | 1 | |
| R306, 307 | ERDS2TJ104 | —— | —— | — | Deletion |
| R327 | —— | **ERDS2TJ822** | 8.2kΩ [EG, Ei] only | 1 | Addition |
| R328 | —— | **ERDS2TJ272** | 2.7kΩ [EG, Ei] only | 1 | Addition |
| R331, 332 | —— | **ERDS2TJ153** | 15kΩ [EG, Ei] only | 1 | Addition |
| | | **ERDS2TJ104** | 100kΩ [other] | 1 | Addition |
| R348 | —— | **ERDS2TJ392** | 3.9kΩ [EG, Ei] only | 1 | Addition |
| R602, 609 | ERDS2TJ561 | **ERDS2TJ681** | 680Ω [EG, Ei] only | 2 | |
| R911 | —— | **ERDS2TJ102** | 1kΩ | 1 | Addition |
| R912 | —— | **ERDS2TJ822** | 8.2kΩ | 1 | Addition |
| R951 | ERDS2TJ102 | —— | 1kΩ | — | Deletion |
| R952 | ERDS2TJ332 | —— | 3.3kΩ | — | Deletion |
| R953 | ERDS2TJ123 | —— | 12kΩ | — | Deletion |
| R954 | ERDS2TJ102 | —— | 1kΩ | — | Deletion |
| R955 | ERDS2TJ822 | —— | 8.2kΩ | — | Deletion |
| CAPACITORS | | | | | |
| C203 | ECCD1H150KC | **RCBS1H180JCY** | 18PF | 1 | |
| C221 | —— | **ECQM1H223JZ** | 0.01μF | 1 | Addition |
| C251 | ECQP1391JZ | —— | —— | 1 | Deletion |
| C305, 306 | ECQM1H153JZ | **ECQM1H223JZ** | 0.022μF [PA, PE] only | 1 | |
| | | **ECQB1H153JZ** | 0.015μF [EG, Ei] only | 1 | |
| C322 | —— | **ECQM1H102JZ** | 0.001μF [EG, Ei] only | 1 | Addition |
| C323, 324 | —— | **ECFTD272KXL** | 0.0027μF [EG, Ei] only | 1 | Addition |
| C329, 911 | —— | **ECKD1H103PF** | 0.01μF [EG, Ei] only | 2 | Addition |
| C951 | ECKD1H223PF | —— | —— | — | Deletion |
| C952 | ECEA1HU010 | —— | —— | — | Deletion |
| C953 | ECQM1H223JZ | —— | —— | — | Deletion |
| TRANSISTORS | | | | | |
| Q251～253 | 2SC3311A-Q | —— | —— | — | Deletion |
| Q255 | 2SA1175FE | —— | —— | — | Deletion |
| Q904 | 2SA1175FE | **2SA1309AQS** | —— | 1 | |
| Q951, 952 | 2SC3311A-Q | —— | —— | — | Deletion |
| DIODES | | | | | |
| D926 | MA165 | —— | [XA] only | — | Deletion |
| D927 | —— | **MA165** | [XA] only | 1 | Addition |
| D931 | MA165 | —— | —— | — | Deletion |
| VARIABLE CAPACITORS | | | | | |
| CT251 | SVCTZ03R200F | —— | —— | — | Deletion |
| COILS AND TRANSFORMERS | | | | | |
| L202 | SLA2B3-P | **SLA2B1-1M** | ANTENNA COIL | 1 | |
| L203 | SLO2B9R-P | **SLO2B7-M** | OSCILLATOR COIL | 1 | |



| Ref. No. | Change of Part No. | | Part Name & Description | Pcs Set | Remarks |
|---|---|---|---|---|---|
| | ST-G45AL [EK] → | **ST-G45A [EX, EH, XL, XA, PA, PE, EG, Ei]** | | | |
| L251 | SLA1B7R-P | —— | —— | — | Deletion |
| L252 | SLO1B5-P | —— | —— | — | Deletion |
| L301, 302 | —— | **SLM5B2-1P** | [EG, Ei] only L.P.F. | 2 | Addition |
| L303 | —— | **SLM1B1-P** | [EG, Ei] only L.P.F. | 1 | Addition |
| L701 | —— | **SLQZ650MH49** | [EG, Ei] only CHOKE COIL | 1 | Addition |
| T701 | SLT5K175 | **SLT5K171** | [EX, EH, EG, Ei] only POWER TRANSFORMER | 1 | ⚠ |
| | | **SLT5K173** | [XA, PA, PE] only POWER TRANSFORMER | 1 | ⚠ |
| | | **SLT5K175** | [XL] only POWER TRANSFORMER | 1 | ⚠ |
| FRONT PACKS | | | | | |
| FE | SNVFE306E15 | **SNVFE306G25** | [EG, Ei] only FRONT END PACK | 1 | |
| FUSES | | | | | |
| F1 | XBA2C05TB0 | **XBA2C05TR0** | 250V, T0.5A | 1 | ⚠ |
| SWITCHES | | | | | |
| S13～15 | SSG13 | —— | —— | — | Deletion |
| S16, 17 | —— | **SSG13** | SW, AM/FM | 2 | Addition |
| S702 | —— | **SSR187-1** | [XA, PA, PE] only VOLTAGE SELECTOR | 1 | Addition |
| CABINET AND CHASSIS | | | | | |
| 1 | SGWTG45AL-KE | **SGWTG45A-KE** | FRONT PANEL (K) | 1 | |
| 1 | SGWTG45AL-SE | **SGWTG45A-SE** | FRONT PANEL (S) | 1 | |
| 5 | SBC812A | **SBC811A** | BUTTON, BAND (K) | 1 | |
| 5 | SBC812-1A | **SBC811-1A** | BUTTON, BAND (S) | 1 | |
| 17 | SJS9236 | **SJS9231-1B** | [EG, Ei] only AC SOCKET | 1 | ⚠ |
| 18 | SJF8615N | **SJF8714N** | [XL, XA, PA, PE] only TERMINAL BOARD | 1 | |
| 22 | SGP6373A | **SGP6373B** | [XL] only REAR PANEL | 1 | |
| | | **SGP6373-1A** | [XA, PA, PE] only REAR PANEL | 1 | |
| | | **SGP6373-2A** | [EG] only REAR PANEL | 1 | |
| | | **SGP6373-2F** | [Ei] only REAR PANEL | 1 | |
| 34 | —— | **SUS772** | [PA, PE, EG, Ei] only SPRING | 1 | Addition |
| 35 | —— | **XTBS3+20F1** | [EG, Ei] only SCREW | 1 | Addition |
| 36 | —— | **SJS9231A** | [EG, Ei] only SOCKET COVER | 1 | Addition |
| PACKINGS | | | | | |
| P1 | SPG5947 | **SPG5945** | [XL] only CARTON BOX | 1 | |
| | | **SPG5946** | [Ei] only CARTON BOX | 1 | |
| | | **SPG5944** | [other] CARTON BOX | 1 | |
| P2 | SPS4550-7 | **SPS4550-1** | [XL] only PAD | 1 | |
| P3 | SPS4551-4 | **SPS4551-1** | [XL] only PAD | 1 | |
| P7 | —— | **SPS4672** | [XL] only PAD | 1 | Addition |
| ACCESSORIES | | | | | |
| A1 | SFDAC05G02 | **SFDAC05E03** | [EX, EH, EG, Ei] only POWER CORD | 1 | ⚠ |
| | | **SJA163** | [XL] only POWER CORD | 1 | ⚠ |
| | | **SJA168-1** | [XA, PA, PE] only POWER CORD | 1 | ⚠ |
| A3 | SJP9009 | **SJP9215** | [XA, PA, PE] only PLUG | 1 | |
| A4 | SSA270M | **SSA269M** | [XL, XA, PA, PE] only FM ANTENNA CORD | 1 | |
| A6 | SQF12889-2 | **SQF12891** | [PA, PE] only INSTRUCTION BOOK | 1 | |
| | | **SQF12890** | [EG] only INSTRUCTION BOOK | 1 | |
| | | **SQF12894** | [Ei] only INSTRUCTION BOOK | 1 | |

## ■ EXPLODED VIEW





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